THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

$2.00 A COPY; $44/YEAR SEPTEMBER 9, 1985 VOL. XIX, NO. 36

Family tree
From dampers to DP: Honeywell **95**

The chips are down
Analyst says until 1988/**115**

In Depth
Subsecond response time: Are you moving too fast?/**ID/5**

In Depth
Riding the wave of documentation

Trade bans anger users in S. Africa

DP community fears halt in U.S. computer imports

By John Desmond

The South African community of computer users is fortifying itself for a restriction on the sale of computer hardware and software from the U.S.

This was the consensus gathered from a series of telephone interviews with South African computer users, vendors and observers conducted by *Computerworld* last week.

The U.S. Congress is considering legislation that would ban the sale of computer hardware, software and services to agencies of the South African government that administer apartheid, the policy of racial separation. A vote on the legislation is expected in the U.S. Senate this week.

"Any kind of restrictive or punitive action would be a great disappointment," said Jack van Nunen, DP manager at a Johannesburg insurance company and spokesman for the 220-member Computer Users Council of South Africa.

John Millin, Amdahl Corp.'s manager in South Africa, added, "The action by the U.S. government is just helping to kill U.S.-based companies in South Africa. There will always be vendors prepared to supply equivalent equipment. The U.S. government can't apply its rules to the rest of the world. [The ones that] will suffer are the U.S. corporations [that] are trying to influence the government here to make reforms."

The impact of the restrictions, if passed, would depend on the pressure the U.S. puts on the Japanese and European governments not to sell computer technology to affected agencies of the South African government, Millin said.

The bill being considered by Congress, the Anti-Apartheid Act of 1985, would prevent the sale of computers to the South African military, police, prison system, national security agencies and the Department of Cooperation and Development, which administers the affairs of blacks in the townships [CW, June 17].

The bill would not essentially change restrictions that have been in place since 1978, when President Carter restricted the sale of computer equipment to all the above-named agencies of the South African government. Those restrictions are being honored by U.S. companies, several sources said.

However, approval of the bill by Congress and President Reagan would make South African users more reluctant to do business with U.S. companies, according to Mias van Vuuren, general manager for Burroughs Corp. in South Africa.

"Most South African customers would consider it risky to do business with U.S. suppliers because the embargo might be

Continued on page 10

AT&T, Sun to redo Unix

By John Desmond

AT&T and Mountain View, Calif.-based Sun Microsystems, Inc. said last week that they are working together on a convergence of AT&T's Unix System V with Sun's University of California at Berkeley Unix 4.2-based operating system.

Unix System V is currently an industry standard for commercial users, while Berkeley Unix 4.2 is used widely in the academic and scientific communities.

According to Bill Joy, vice-president of research and development at Sun and a principal designer of Berkeley Unix 4.2, "This is a significant step toward unifying the Unix system license community around a single standard. The joint AT&T and Sun effort will work on evolving the System V standard to accommodate the services offered by [Berkeley 4.2]."

The converged system will continue to run System V applications and will provide advanced networking services that have previously only been available in

Continued on page 12

TOP OF THE NEWS

With a leveraged offering. Asher Edelman wants to take Datapoint private. **Page 2.**

■

Making memories. AT&T starts producing its 1M-bit memory chip. **Page 12.**

■

Just like the private sector, government DP budgets hit a plateau this year, according to the Office of Management and Budget. **Page 14.**

■

A new slant. Digital Research is turning to applications packages and away from systems software. **Page 115.**

Debuts link firm's line of software

Martin Marietta offerings further its master plan

By John Gallant

NEW YORK — Martin Marietta Data Systems last week introduced the first offerings in a projected product line designed to tie together the company's disparate software systems.

The announcement is the latest move in Martin Marietta's two-pronged strategy of internal development and aggressive acquisition, through which the Greenbelt, Md.-based company is becoming one of the largest players in the software industry.

At last week's press conference, held at the trophy-stuffed Explorer's Club in midtown Manhattan, Martin Marietta introduced an on-line applications development facility that allows users to build systems with either a Cobol-based tool, a fourth-generation language or a menu-driven generator.

The company also unveiled IBM Personal Computer-based integrated workstation software that offers micro-to-mainframe communications capabilities, an as-yet-incomplete implementation of its mainframe-based fourth-generation language and gateways to a variety of mainframe data storage systems.

The Consensus applications development system and Unison workstation software are the initial fruits of Martin Marietta's fledgling Natural Selection series of software. Two additional Natural Selection series announcements will be made later this year, Martin Marietta spokesmen said.

Continued on page 6

PROFILE

King without a kingdom

By Edward Warner

Picture the data processing manager of a multinational corporation, and you imagine a person in command of rows of mainframes and a staff of hundreds.

Not at United Technologies Corp.

The data processing manager of this $9.9 billion international conglomerate, ranked 16th among the Fortune 500, presides over a lone minicomputer and a staff averaging 15 people.

United Technologies prefers to let each of its major subsidiaries do its own data processing with only limited oversight from corporate headquarters. As a result, though John Bennett carries the lofty title of United Technologies data processing director, he is a king without a kingdom.

While policy statements with corporatewide impact do come from the firm's headquarters in Hartford, Conn., decisions concerned with data processing are often produced by committees of DP managers and analysts drawn from the various subsidiaries. Bennett said in a recent interview that his responsibility to those committees and to United Technologies' DP managers in general "is to ensure that everybody knows everybody and that everybody knows what everybody is doing."

As the man responsible for setting United Technologies' companywide DP standards, Bennett does issue a few proclamations of his own. A recent mandate,

Continued on page 8

NEWSPAPER

Datapoint head offers buy-out

By Peter Bartolik

Asher B. Edelman's plans to exercise his control of Datapoint Corp. took yet another dramatic and controversial turn last week when he presented a plan to take the company private in a leveraged buy-out.

The San Antonio-based company said Wednesday that Edelman, who is chairman of the board, offered a plan to pay shareholders — other than the members of the buy-out group — $6 per share, for a total value of about $100 million, and take the company private.

In another development the same day, Datapoint's spin-off service division, Intelogic Trace, Inc., said it rejected a $177 million buy-out offer made by TRW, Inc.

Intelogic Trace, of which Edelman is also the chairman, reported the termination of discussions to acquire the service arm of Mohawk Data Sciences Corp., a firm in which Edelman owns stock and that he has previously sought to liquidate.

In a phone interview with *Computerworld*, Edelman said he thinks customers will be encouraged by his bid. "I think in general the customer base, many of whom I've seen in the last few months, will understand there is a commitment both on my part and on management's part to stay in this company and continue to build it; we will be the owners," he said.

Analysts reacted negatively, speculating Edelman would seek to milk Datapoint's assets to recoup his investment and then sell the company as he has done with others. But Edelman pointed out that the first company he bought into is still active, and he serves as its vice-chairman. His strategy varies "according to the company — [at Datapoint] when I got into it I said I wanted to stay there; I've stayed there, I've worked hard, I've visited customers."

Edelman's bid to take Datapoint private marks another departure from his original intent to duplicate the control, divide and sell strategy that worked when he gained control of Management Assistance, Inc. in August 1984 and sold off its operating divisions.

He then turned his eye first to Mohawk Data and then to Datapoint, using the same strategy of acquiring minority interests and presenting well-publicized plans to liquidate the firms.

After gaining the chairmanship and control of half the board of directors of Datapoint in March, Edelman said he was looking to sell the service division for $200 million and the manufacturing division for $100 million. He soon changed direction, however, and said he would continue to operate the manufacturing division, and the service division was spun off as a separate company owned by the shareholders of Datapoint.

Intelogic Trace then said it would acquire the service arm of Mohawk Data for $80 million and loan Mohawk $20 million; that was a controversial plan that analysts interpreted as an attempt to bail out Edelman's 8% holding in Mohawk Data.

Edelman last week presented Datapoint with his plan to take the company private, saying he and some of his affiliates, together with Datapoint board member Charles P. Stevenson Jr. and certain other members of the board and management of the company, would form a corporation with which to merge Datapoint.

Company spokesman Jack Milne told *Computerworld* that all of the other members of the buy-out team have not been identified "but certainly will include the key individuals."

Datapoint said the proposal is dependent upon the ability of the Edelman group to obtain financing and a favorable recommendation of an investment firm. After those conditions are met, the proposal would be subject to a majority vote of shareholders.

Intelogic Trace, in announcing its rejection of TRW's offer of $9.50 per share, said it would offer instead an exchange of securities for up to four million of its 17 million outstanding shares for those shareholders who want to cash in their investment.

Report to investigate data security

Securing data against intruders inside and outside a firm remains a high priority for MIS managers.

Computerworld's Nov. 25 Special Report on protecting the corporate information resource will address data security problems and offer solutions for correcting them.

Article contributions are now being considered. They should take one of two forms: A tutorial article discussing an issue or an application story outlining a user's experience.

The deadline for submissions is Sept. 25. Articles must be typed, double-spaced and range from three to five pages. Artwork is welcome.

If you have a story or an opinion, contact Janet Fiderio, Special Reports Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

NEWS SUMMARY

Storage Technology is offering upgrades for its solid-state storage subsystem, the 4305 Optimizer/**4**

Electronic messaging makes a push into upper management, stretching the functionality of microcomputers/**6**

An early user lauded Martin Marietta Data Systems for attempting to link components in its Consensus applications development system/**7**

Computer Sciences has withdrawn its investment in a South African computer firm, maintaining that the move was motivated by finances, not politics/**10**

Some legislators want to regulate messages on computer bulletin boards, but the efforts face strong opposition/**13**

DP expenditures by the U.S. government are flattening out, as they are in the private sector, according to a government report/**14**

Although they accounted for only 1% of total 1984 computer shipments, large systems garnered more than $1 billion in sales/**15**

IN DEPTH

Subsecond response time/**ID/5**
The next wave of user documentation/**ID/15**
The politics of data/**ID/25**

Washington Update/**24**
World Digest/**26**
Turnaround Time/**57**
Calendar/**58**

EDITORIAL/16
SOFTWARE & SERVICES/61
MICROCOMPUTERS/77
COMMUNICATIONS/87
SYSTEMS & PERIPHERALS/95
COMPUTER INDUSTRY/115

Random access

The U.S. Department of Defense, which evaluates the security features of various packages, has bestowed a B2 security rating on Honeywell, Inc.'s Multics operating system. The Multics rating represents the highest rating ever given to a general-purpose software package. Comparatively, add-on security packages such as IBM's RACF and GCA Software Products Group, Inc.'s Topsecret have earned C1 and C2 ratings, respectively.

■

Datapoint Corp. will unveil its new top-of-the-line minicomputer today. The 16-bit, 4M-byte CPU was designed to replace the Datapoint 8800 series machines as the file server in an Arc local-area network. Accompanying the machine is Datapoint's largest ever disk storage system, with capacity of up to 2G bytes. Entry-level prices are less than $17,000 for the mini and $14,500 for the storage system in 67M-byte capacity. Also on the Datapoint menu of today's announcements is a local-area network management software/hardware package for Arc and Arcnet systems.

■

Troubled switch manufacturer Ztel, Inc. will announce at the Telecommunications Association conference in San Diego next week that it has sold six of its Private Network Exchanges (PNX), according to industry sources. While still referring to the product as a fourth-generation private branch exchange, Ztel is now downplaying the formerly highly touted local network capabilities, saying they will not be available in the near future. None of the six installed PNXs are multinode, a formerly extolled capability, and all user sites are said to have fewer than 450 lines.

The company, adjusting to new management after a major organizational shake-up that saw it enter Chapter 11 of the Federal Bankruptcy Act in a financing maneuver, is now selling the PNX on capabilities similar to other voice/data switches.

■

Mentor Graphics Corp. of Beaverton, Ore., is stepping out of its usual role as a software development and OEM house handling Apollo Computer engineering workstations. Mentor Graphics will announce next month its first in-house-developed hardware product, a reduced instruction set computer-based plug-in addition for Apollo workstations. The general-purpose accelerator also is being considered for future release as a stand-alone model that could be used with other workstations.

■

Big Blue is showing some interest in Ada, the high-level programming language developed by the U.S. military. IBM was the first subscriber to a new Ada software product line called Generic Reusable Ada Components for Engineering, according to Ralph Crafts, executive vice-president of the vendor, EVB Software Engineering, Inc. of Rockville, Md. The modules, provided monthly for a subscription fee, can be embedded in the customer's own programs.

■

John Cunningham, former president of Wang and the new chairman of Computer Consoles, Inc. of Rochester, N.Y., said that Computer Consoles will announce a low-end processor running AT&T's Unix operating system prior to the Unix Expo set for Sept. 18-20 in New York. The processor will be designed to offer an alternative to Computer Consoles Power 6/32 superminicomputer line, which represents "too much horsepower and too high an entry price" for many small businesses, Cunningham said. Computer Consoles sells Unix-based systems to vertical office markets, including law and financial offices.

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STC enhances storage tool

By James Connolly

LOUISVILLE, Colo. — The company that claims 90% of the market share for IBM mainframe-oriented, solid-state storage equipment, Storage Technology Corp., has announced enhancements for its 4305 Optimizer Storage Subsystem.

The 4305E Optimizer has four times the storage capacity and twice the number of channels as the existing 4305 Optimizer, according to the announcement made last week. The enhanced system features a capacity of 768M bytes and a maximum of eight channels for connection to up to eight host computers.

"The computer views a solid-state system as a disk drive, except it is faster. The kind of data this product is aimed at is in the ultra-high-performance data sets, of which there are maybe 45 or 50 in a typical IBM system," said Fred Moore, manager of worldwide product marketing for STC.

The product reportedly is intended for use in IBM VM systems handling paging and swapping and is used increasingly for data files with high transaction rates. The latter applications, according to STC, include IBM IMS and CICS load libraries, data base indexes, master catalogs and computer-aided design and manufacturing roll files.

Moore said that STC is offering field upgrades for the 5,500 4305 Optimizers installed since the product was announced in 1979. He said STC has sold more than 90% of the solid-state subsystems installed in IBM and compatible mainframe systems.

The 4305E Optimizer uses 256K-byte random-access memory (RAM) chips rather than the 64K-byte RAM chips used in the earlier, 192M-byte version. Memory expansion is through modules of 12M, 24M, 48M and 96M bytes, according to Moore.

The additional channels may be added through use of a four-channel switch, which allows each director in the 4305E Optimizer to be attached to four channels rather than the two channels previously permitted. Each subsystem can have one or two directors, according to STC. The host connections are provided via block multiplex channels supporting 1M, 1.5M and 3M byte/sec. data transfer rates.

The 4305E Optimizer was designed to emulate an IBM 3380 disk drive or an IBM 2305 fixed-head drum device. Moore said the access time for the solid-state system is 0.3 msec, compared with 16 msec for a disk drive.

A single-director, 12M-byte 4305E Optimizer costs $69,100. A two-director, dual-port, 768M-byte configuration costs $1.33 million. For existing equipment in the maximum configuration, an increase from a two-channel switch to a four-channel switch costs $17,200, and an increase from 192M bytes of storage to 768M bytes costs $720,000, Moore said.

NAS beefs up systems

Add-ons target 6600, 9100 processor lines

By Jeffry Beeler

MOUNTAIN VIEW, Calif. — National Advanced Systems Corp. (NAS), reacting to user demand for increased systems functionality, last week added two hardware enhancements to its mid-range scalar mainframe family and two software improvements to its attached vector processor.

In the wake of NAS' Sept. 4 announcement, the company's 6600 series intermediate-scale CPUs now support IBM's High-Accuracy Arithmetic feature and the Engineering and Scientific Assist, both residing in IBM microcode.

NAS has also enhanced its 9100 vector processor through a recently signed agreement with Quantitative Technology Corp., a Beaverton, Ore.-based software and services supplier. The accord paves the way for the 9100 to support Quantitative Technology's Math Advantage, an algorithm library that helps develop scientific and engineering applications.

In a related development, NAS has further enhanced the 9100 through an agreement with a second business partner — Pacific Sierra Research Corp., developers of the Vector Array Syntax Translator (Vast), which "vectorizes" scalar program code. The contract gives NAS' attached supercomputer access to Pacific Sierra's latest enhancements to Vast.

In addition to streamlining Vast's code and thus speeding its operation, Pacific Sierra has revised the product to support complex numbers and to execute the First-Order Iteration instruction, according to Claude Steinmayer, NAS' manager of scientific marketing.

"The 9100's hardware has always had the ability to support First-Order Iteration, but until Vast was enhanced, [the machine] lacked the software to take advantage of that instruction," Steinmayer said.

Like Vast, Math Advantage is optimized for image and signal processing, seismic analysis, mechanical design and other number-crunching applications that run on systems compatible with the IBM 370 or 370 Extended Architecture.

All the latest enhancements to the 6600 and 9100 are available immediately without charge.

ITC upholds Tandon claim

By Clinton Wilder

WASHINGTON, D.C. — The U.S. International Trade Commission (ITC) last week granted temporary relief to Tandon Corp. in the disk drive vendor's fight to bar imports of Mitsubishi Electronics Corp.'s competing products into the U.S.

Affirming a May 31 ruling by federal Judge Sidney P. Harris [CW, June 10], the ITC required Mitsubishi to post a 25% bond on every double-sided floppy disk drive it sells to its U.S. subsidiary or to U.S. OEMs and end users.

If the ITC grants Tandon permanent relief in a final decision expected later this year, the total of all the posted bonds would go into the U.S. Treasury, and Mitsubishi would be banned from all sales of the named disk drives into the U.S.

Tandon has alleged that the Mitsubishi drives infringe on Tandon patents. In a companion case, Chatsworth, Calif.-based Tandon has also claimed that Mitsubishi has illegally sold the products below cost in the U.S. Harris' initial decision on that claim is expected in October.

Earlier this year, Tandon settled similar patent infringement claims against Japanese disk drive vendors Teac Corp. [CW, Aug. 26] and Sony Corp. [CW, July 15]. Rulings in Tandon's favor helped spur the Japanese companies to settle out of court and become Tandon licensees, but it is unclear whether Mitsubishi will attempt to strike a similar settlement.

"There are no such negotiations currently going on, but who knows what tomorrow may bring?" said Tandon attorney James Hamilton.

Mitsubishi attorneys could not be reached for comment.

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Excelan also offers similar packages for DEC PDPs, UNIX supermicros, and the IBM PC, XT and AT.

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Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN-0010-4841) is published weekly, except: January (5 issues), February (5 issues), March (5 issues), April (6 issues), May (5 issues), June (5 issues), August (5 issues), September (7 issues), October (5 issues), November (5 issues), December (5 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

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Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

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WHODUNIT

Sortland Yard warns against “Raffles-type sort programs.”

Call (201) 568-9700.

Ask for Inspector SyncSort!

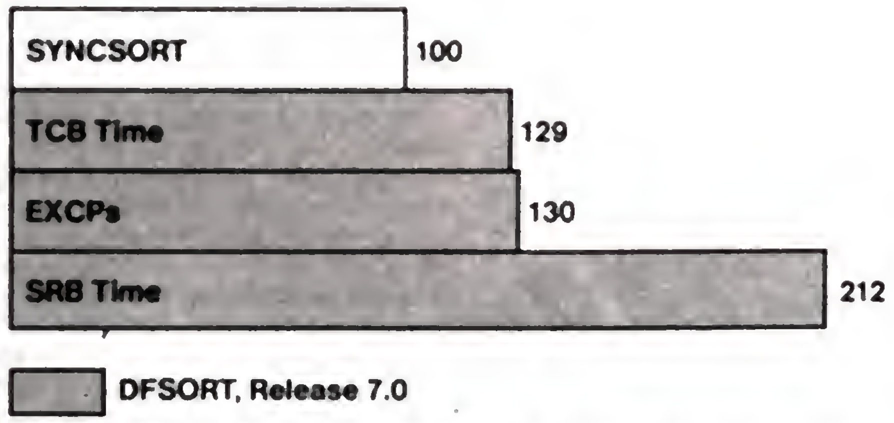
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed “gentleman-bandit sort programs.”

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called “a legend in his own CPU time.”

The inspector said, “One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row.”

EXPERT COMPUTER CRACKERS. “But once the party is underway,” the inspector said, “these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say ‘Hound of the Baskervilles.’”

To indicate “the true cost of this sort of misbehavior,” the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often “take a dreadful toll” of programmers. “They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world.”

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. “The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down.”

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied. “They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!”

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From page 1

Debuts link Martin Marietta's software line

Borrowing from the theory of evolution, the Natural Selection theme is intended to convey the firm's goal of integrating and building on the capabilities of its existing products.

Consensus, for example, combines Martin Marietta's newly developed On-Line Programming Language, Fourth Generation (OPL4) with the UFO menu-driven application development system and its Cobol/XE development tool.

Martin Marietta obtained UFO and Cobol/XE's predecessor, UFO/Cobol, when it acquired Oxford Software Corp. in 1984. A Martin Marietta spokesman said the principal designer of UFO also headed up the development team of the OPL4 fourth-generation transaction processing language.

One beta site user of the Consensus system told *Computerworld* that while the three individual products are not yet fully integrated, he is encouraged that Martin Marietta has outlined a growth strategy for UFO and Cobol/XE, which he said are exceptional development tools.

The user said he is also pleased that the company has offered new application building capabilities — the OPL4 language — and intends to fully integrate the development systems.

In its final form, a spokesman said, Martin Marietta's Unison software will give IBM Personal Computer users the full functionality of the Ramis II fourth-generation language in addition to its other workstation capabilities. In 1983, Martin Marietta acquired Mathematica Products Group, developer of Ramis II.

According to Dan Peterson, vice-president of business development for parent company Martin Marietta Corp., the Natural Selection series is the culmination of the company's master plan, forged in 1982, to become a major software and services vendor.

In addition to the products, the company offers the MAS series of mainframe applications and the IT-Series of microcomputer software. The Natural Selection line is Martin Marietta's approach to integrating its nearly 35 member family of software products.

"Three years ago, we identified information technology, particularly the software market, as a strategic growth area for Martin Marietta," Peterson said. "In order to become a leader, we undertook our own development of products and acquired companies that were leaders in their fields.

"Our goal is to provide products and services that grow and change," he continued. "These announcements are not a break from the past but an outgrowth of our existing offerings to ensure continuing growth and success for us and our users."

■

Martin Marietta tools aim at integrated line

Based on its UFO and Cobol/XE applications building systems and in-

Continued on page 7

Micro use sells messaging to top execs

By Bryan Wilkins

WASHINGTON, D.C. — Electronic mail messaging is pushing its way into the reaches of upper and middle-level management of U.S. business as a practical extension of microcomputer use, according to users of existing systems and vendors that sell the tools.

Typical of this trend is the experience of Citicorp, the country's largest bank, which initially set up a turnkey stand-alone messaging system five years ago. "We started out when the boss said, 'Mail is mail, whether hard copy or electronic. Put it in,' " said Richard Coughenour, Citicorp vice-president for office automation and mail systems.

However, most large U.S. corporations are still setting up internal systems and have not yet begun linking discrete networks to others or venturing outside and establishing links via public carriers, according to the speakers addressing the Electronic Mail Association here last week.

At the U.S. Department of Agriculture (USDA), a nationwide message system gradually evolved after it became necessary to keep field offices posted on late-breaking news that affected different regions.

According to Stanley Prochaska, chief of the USDA's special program division, a one-way delivery system was converted into a two-way communications network, and eventually, a two-way, region-specific information system was put into operation. "This took place over the space of a few years. Looking back, it's hard to see how we existed without it," Prochaska said.

The major benefit of electronic mail is the ability to communicate information to all parts of a company or business without the necessity of establishing voice contact.

Memorandums, letters, pricing changes on products and ordering are the functions that many of the speakers at the three-day session described as the principal uses for electronic mail.

Last year, the worldwide standards-setting body, the Consultative Committee on International Telephony and Telegraphy, published the draft version of a protocol standard, CCITT X.400, that will permit different message-handling systems to communicate if the protocol has been built into the terminal handling messages.

The CCITT X.400 standard is being supported by a number of U.S. vendors as well as by European postal authorities that are responsible for management of the message-handling systems using the public network.

However, there are still a number problems, according to Richard Miller, president of Telematics International, Inc. in Palo Alto, Calif. Miller cited one problem as the lack of certification for vendor products that claim to have implemented the CCITT X.400 standard, pointing to the problem of linking incompatible message-handling systems.

According to Coughenour of Citicorp, the success of a message-handling system depends on establishing user familiarity and comfort. "Let the users drive the enhancements that you want to add on, and be flexible, such as adding bulletin boards and other items," he said.

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From page 6

Martin Marietta tools aim at integrated line

corporating a newly developed fourth-generation language, Martin Marietta Data Systems' Consensus is said to give users a choice of development environments with which to build applications varying in complexity.

UFO, which currently has an installed base of some 1,700 users, allows an IBM CICS applications programmer to develop through menus all modules of an on-line system via an IBM 3270 terminal or Personal Computer/370.

Cobol/XE gives batch Cobol programmers the capability to develop on-line applications, without knowledge of the CICS transaction manager, using standard Cobol verbs and program structure.

The On-line Programming Language, Fourth Generation — known as OPL4 — facilitates modular development of on-line files, screens and programs. What a spokesman labeled "free-format syntax" and built-in functions simplify the coding of operations.

Other facilities include prototyping capabilities, an interactive debugger and a new-copy feature that allows changes to files or screens without recompiling. The language also provides a universal data access command.

The three development systems are said to be integrated with screen painting tools and active data dictionary facilities for maintenance of file descriptions and data validation rules. An optional reporting facility, based on the company's Ramis II Reporter, provides ad hoc and production reporting capabilities.

Consensus supports all standard IBM file access methods and a variety of data base management systems (DBMS), including IBM's SQL/DS, DB2 and DL/1; Cincom Systems, Inc.'s Total; and Applied Data Research, Inc.'s Datacom/DB.

It operates under OS, DOS and VM and is priced from $40,000 to $55,000. Production shipments are slated for October, according to Martin Marietta Data Systems Product Information in Princeton, N.J.

Martin Marietta's Unison workstation software is said to offer five integrated capabilities: transparent micro-to-mainframe communications; gateways to mainframe data storage systems and micro-based data; a workstation-based implementation of the Ramis II fourth-generation language; a manager that provides access to all Unison components and other micro software; and mainframe services that give users access to mainframe Ramis II.

The micro-to-mainframe communications capabilities allow users to choose a mainframe linkage method from a menu. Unison supports dial-up connection and a variety of communications boards.

Unison allows for selective extraction of data from Ramis II, IBM's DB2, IMS, SQL/DS, Vsam and Isam; Software AG's Adabas; Cincom's Total; and Cullinet Software, Inc.'s IDMS. It automatically downloads and converts data for Martin Marietta's Keepit micro software and products supporting standard micro data formats.

Unison also features an interface to IBM's Professional Office System for electronic messaging. Unison's PC/Reporter implements Ramis II reporting capabilities on the IBM Personal Computer. It offers command and menu modes and processes downloaded data or local micro files. A spokesman said the system's capabilities are currently being extended to a full-function implementation of mainframe Ramis II.

Unison's so-called mainframe services let users execute processing on the mainframe or the micro. Requests to be executed on the mainframe can be generated with a micro editor or with PC/Reporter menus, according to the vendor.

Early versions of Unison are being shipped in October, although production shipments are not scheduled until December. Pricing begins at $795.

— **John Gallant**

Consensus user calls for integration ties

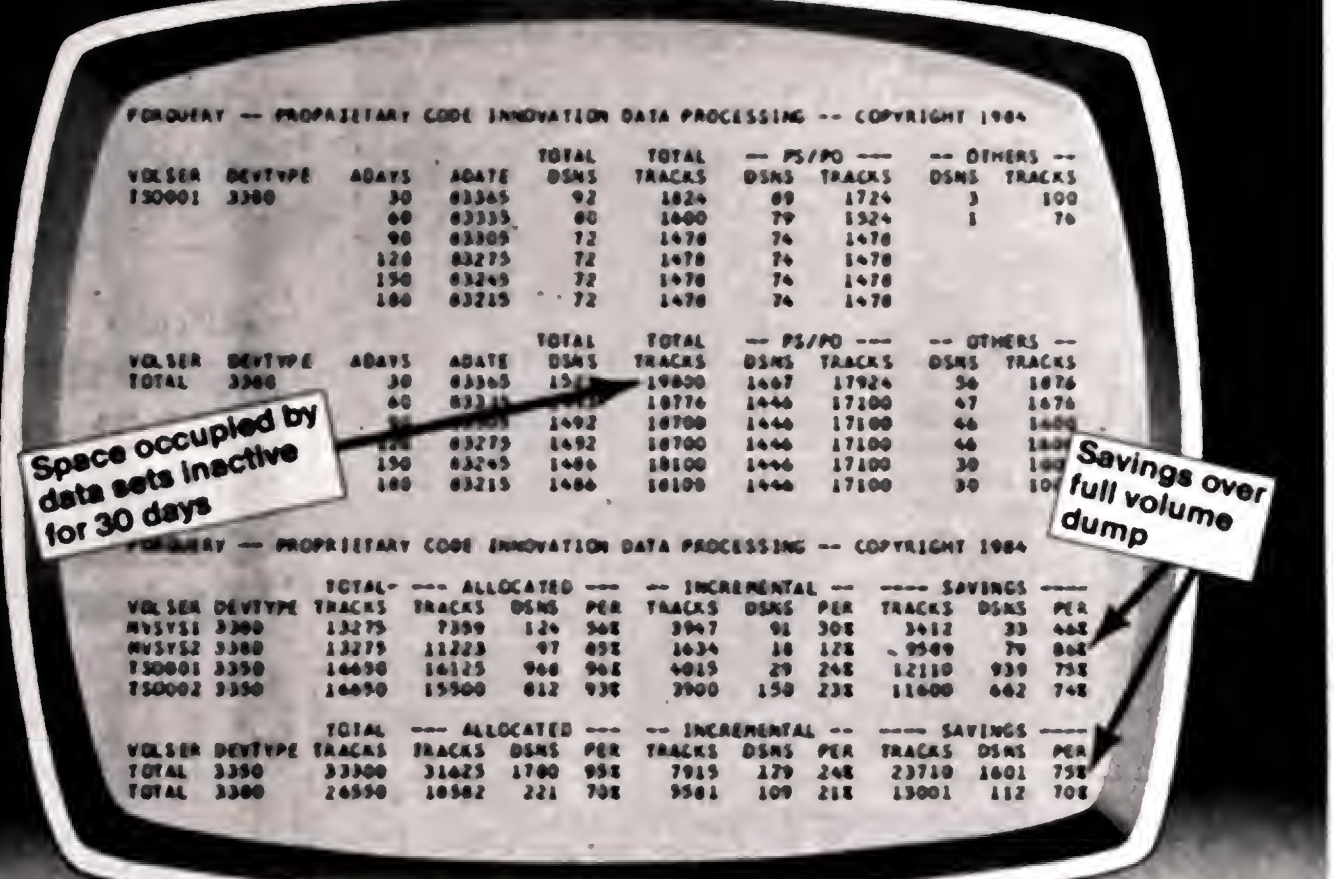
Although one early user of Martin Marietta Data Systems' Consensus applications development system said the product's components more closely resemble stand-alone systems than an integrated development environment, he praised the company's efforts to tie the tools together.

Jerry Tarter, data processing manager for American Business Products, Inc., said his Atlanta-based firm has used the UFO component of Consensus for several years and the Cobol/XE — formerly Oxford Software Corp.'s UFO/Cobol — portion for nearly a year. Tarter said American Business Products, a holding company for several firms that manufacture business forms, only recently installed the OPL4 component and has not yet put that system into production use.

The company runs the products under IBM's DOS/VSE on a 4381, which supports an applications development staff composed of 10 people. Currently, he said, the Consensus components are not fully integrated.

"We are beta testing OPL4 now," Tarter said. "Both UFO and Cobol/XE are outstanding products. But my view is that all three are stand-alone products now, even though they are under one name.

"Martin Marietta's major drive is to tie them all together through a screen painter, data dictionary and report writer common to all the products," he continued. "We are very enthused about that strategy."



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                                    TOTAL    TOTAL   -- PS/PO --   -- OTHERS --
VOLSER  DEVTYPE   ADAYS   ADATE     DSNS     TRACKS  DSNS  TRACKS  DSNS  TRACKS
TSO001  3380         30   83365       92      1824    89    1724     3     100
                     60   83335       80      1600    79    1524     1      76
                     90   83305       72      1470    74    1470
                    120   83275       72      1470    74    1470
                    150   83245       72      1470    74    1470
                    180   83215       72      1470    74    1470

                                    TOTAL    TOTAL   -- PS/PO --   -- OTHERS --
VOLSER  DEVTYPE   ADAYS   ADATE     DSNS     TRACKS  DSNS  TRACKS  DSNS  TRACKS
TOTAL   3380         30   83365     15[illegible] 19800  1667  17924    56    1876
                     60   [illegible] [illegible] 18776  1446  17200    47    1676
                [illegible] [illegible] 1492  18700  1446  17100    46  [illegible]
                [illegible] 83275   1492     18700   1446  17100    46  [illegible]
                    150   83245     1486     18100   1446  17100    30  [illegible]
                    180   83215     1486     18100   1446  17100    30  [illegible]

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                 TOTAL-  --- ALLOCATED ---  -- INCREMENTAL --  ---- SAVINGS ----
VOLSER  DEVTYPE  TRACKS  TRACKS  DSNS  PER  TRACKS  DSNS  PER  TRACKS  DSNS  PER
MVSYS1  3380     13275    7359   126   56%   3947    91   30%   3412    33   46%
MVSYS2  3380     13275   11223    97   85%   1634    18   12%   9589    79   86%
TSO001  3350     16650   16125   968   96%   4015    29   24%  12110   939   75%
TSO002  3350     16650   15500   612   93%   3900   150   23%  11600   662   74%

                 TOTAL   --- ALLOCATED ---  -- INCREMENTAL --  ---- SAVINGS ----
VOLSER  DEVTYPE  TRACKS  TRACKS  DSNS  PER  TRACKS  DSNS  PER  TRACKS  DSNS  PER
TOTAL   3350     33300   31625  1700   95%   7915   179   24%  23710  1601   75%
TOTAL   3380     26550   18582   221   70%   5581   109   21%  13001   112   70%
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From page 1

DP manager Bennett: King without a kingdom

issued in the interest of greater data security, required encryption of all transmitted data. But, he hastened to elaborate, these standards still leave the operating units with considerable freedom.

Such independence can create a maverick or two. Though the firm has been decentralizing data processing since 1971 — even to the point of encouraging the use of personal computers — its Pratt & Whitney subsidiary still relies primarily on mainframes, even for office automation.

Autonomy breeds creativity

Autonomy, however, can also breed creativity, Bennett said. Three years ago, he recalled, the company's corporate leadership decided to implement a program to integrate micros into each operating unit. More than 1,300 top managers from all of the subsidiaries were eventually trained on the IBM Personal Computer at a cost of $8 million.

However, the decision regarding the actual application, if any, for the personal computers was left up to each manager and operating unit. Some managers did eventually ignore the machines, Bennett pointed out, but others, particularly those in financial planning and real estate management, gave up their handheld calculators or mainframe terminals to use the machines.

On the operating unit level, United Technologies' subsidiaries, such as Carrier Corp., the air conditioner maker, have since established companywide electronic mail systems for routing messages from personal computers. Both Carrier and Otis Elevator North American Operations, another subsidiary, have also since developed personal computer programs to sell their products to customers in the building maintenance and contruction industries.

There was at least one down side to the autonomy offered to the personal computer users: Many could not access data on their company mainframe, and, because the subsidiaries are independent, Bennett could do nothing for them. In a conglomerate of independent subsidiaries, mainframe access is "the primary responsibility of the operating unit," he said.

One sector of the corporation in which Bennett will permit no mavericks, however, is in the use of Technet, the 5-year-old United Technologies communications network that his department manages. The network, for corporatewide voice/data communications, routes messages over a variety of paths, including satellite links and both leased and dial-up lines.

Bennett said Technet, one of the few centralized aspects of United Technologies' information management, was placed under his authority because "if [the operating units] aren't under the same management, someone has to keep them talking."

Bennett is not a typical data processing manager, and his office on the 22nd floor of United Technologies' world headquarters reflects the difference. Furnished with a couch and a hardwood desk that would please any vice-president, the office has two glass walls, one of which offers a panoramic view of Hartford and its environs.

Also atypical is Bennett's background. He has a Ph.D. in applied mathematics from Harvard University, and his first management job in data processing came in 1971 when he was promoted from chief of mathematical analysis at the United Technologies Research Center to DP director at the company's Sikorsky Aircraft subsidiary, reportedly the world's largest helicopter maker.

The transition from the research center to the DP shop was "something of a culture shock," he recalled. He soon found, however, that he "probably had something of an advantage coming in from the research center, whose job is also to manage technology." Bennett still runs a DP shop; he oversees the operation of a Digital Equipment Corp. VAX-11/780 in use at the corporate headquarters for office automation.

Looking back on his 14 years of DP management at United Technologies, Bennett observed, only half in jest, that "the computer has made major inroads in almost every department except the data processing department." This failure to automate, he said, is reflected in the extensive backlog of applications development, and this, he added, is the foremost DP problem facing United Technologies.

To reduce its backlog, Bennett said, the firm will soon "put in place [software development] tools that will do a lot more than one programmer can do." In classic United Technologies fashion, those packages will be chosen by a committee.

Though an advocate of decentralized decision making, Bennett acknowledged that there are times when the key to a project's success is a statement of support from corporate headquarters. Such support was needed when the company began its personal computer training in 1982. To spur enrollment in the training, Bennett obtained a videotape endorsement of personal computing from United Technologies Chairman Harry Gray. The course proved a success but missed its objective of training all top company executives.

Gray, it seems, did not attend. The United Technologies chairman, Bennett said, does not use a personal computer.

John Bennett

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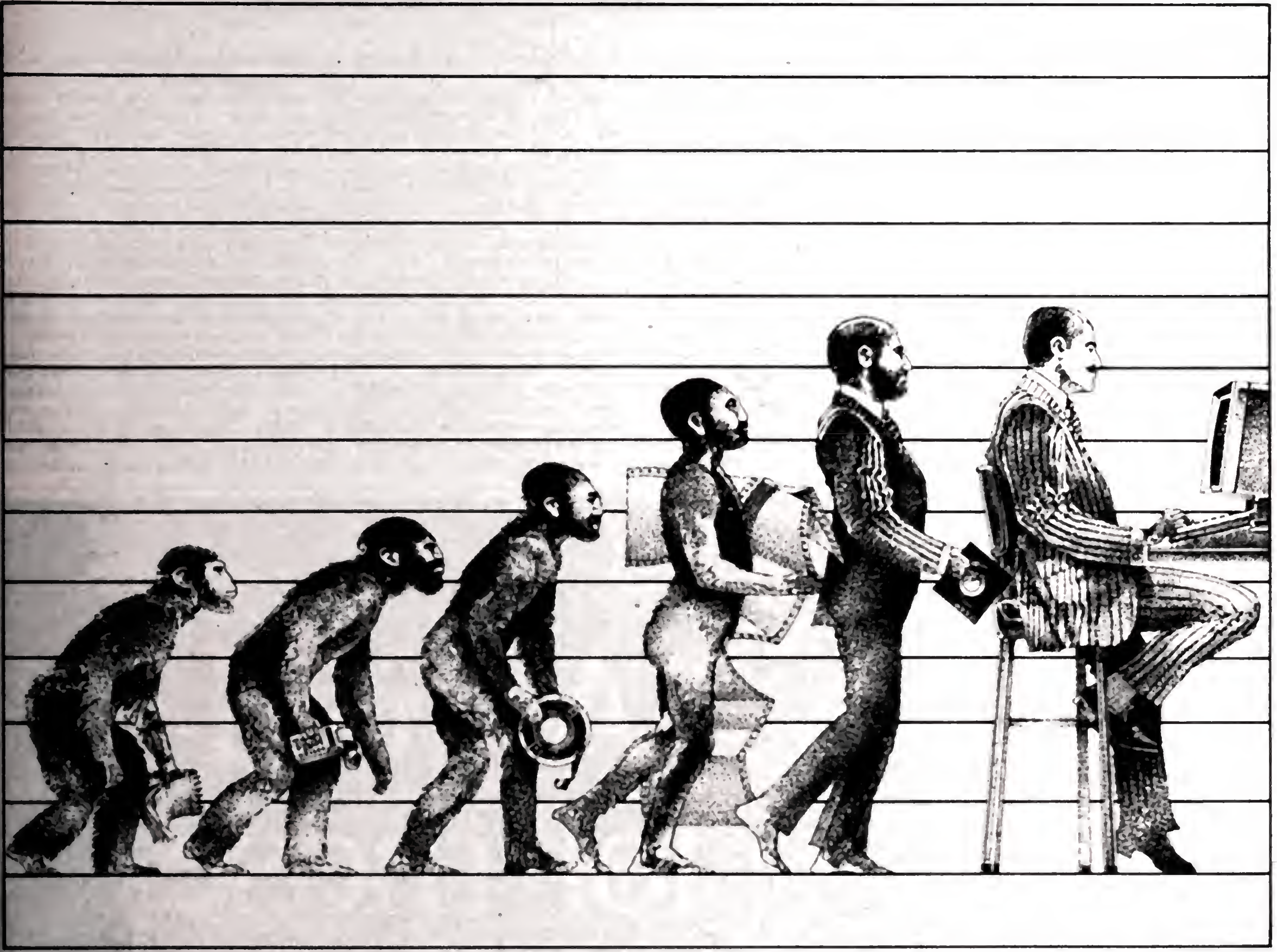

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From page 1

South Africans prepare for U.S. DP export ban

extended if the Congress considers insufficient progress is being made to effect change," van Vuuren said. "The South African customers would look to other suppliers."

One of those suppliers is Persetel, Ltd., the South African company that sells Hitachi Ltd. mainframes in South Africa through BASF of West Germany. The same company sells media products in the U.S. as BASF Systems Corp. in Bedford, Mass. "Persetel has made major inroads into IBM's mainframe marketing in this country," said Alan Dawson, editor of *Computer Week*, a publication covering the computer industry in South Africa. "They are positioned to move in and take over if they need to. They are giving IBM a run for their money." IBM is considered the leading vendor in South Africa, Dawson said.

Other companies with a strong presence in South Africa are Siemens AG and Nixdorf Computer AG of West Germany and ICL of England, according to van Vuuren. "The South African marketplace is a cosmos of all the electronic data processing markets in the rest of the world," van Vuuren said.

Estimates of annual computer sales revenues in South Africa range from $500 million to $900 million. The restricted government market may be 20% of the total South African computer market, van Vuuren estimated. "It is a very large sector we have been excluded from," he said.

Exactly what computer equipment the Department of Cooperation in Pretoria is using to administer the pass-book system, in which each of the nation's 24 million blacks is supposedly registered, is a state secret, several sources said.

Van Nunen, the Computer Users Council spokesman, said the U.S. restrictions would not prevent South African users from obtaining needed technology. "If the supply [of computer equipment] were to be restricted, it will not stop technology from coming into South Africa," he said. "The only impact will be that the U.S. will become a supplier looked on with less favor for any future decisions. South Africans will look elsewhere. It will be a great pity."

The Japanese and Europeans would be the most likely to step into the breach, in van Nunen's view.

According to an IBM spokesman specializing in the firm's South African business affairs, who asked not to be identified, the threat of trade restrictions has caused some customers to "hedge their bets and go with foreign competitors." And sales representatives from foreign countries are exploiting the users' fears of losing their computer equipment sources, the spokesman said. Addressing the restrictions, the spokesman said, "We prefer to operate without regulation, but we comply with all U:S. laws and regulations. Our preference is to operate in a free market environment."

Clarifying what he described as a misconception, the IBM spokesman added, "Most people believe we're in South Africa for cheap labor. But we don't manufacture there, and we pay equal pay for equal work."

Whether the Japanese and European computer companies would sympathize with a U.S. restriction on sale of equipment to the government is not yet known, but is considered unlikely. A spokesman for Persetel in Johannesburg, Product Manager Peter Cilliers, said, "Our standpoint is, we comply with all the regulations and principles of the respective countries of companies that supply equipment to us." He said he understood the Japanese "are reviewing the situation," but his company has not formally requested a ruling.

Vendor spokesmen describe the U.S. trade restrictions as a two-edged sword because many U.S. companies doing business in South Africa pay a percentage of their revenues for social programs to benefit the blacks.

Trade restrictions are not the only issues faced by computer users and vendors in South Africa. Financial panic two weeks ago plunged the South African rand to a low of 34 cents to the U.S. dollar. The rand had climbed to 45.5 cents by the middle of

■

CSC withdraws from South African firm

Computer Sciences Corp. (CSC) of El Segundo, Calif., has withdrawn its 20% interest in the South African computer services firm Computer Science, Ltd. (CSL) of Johannesburg.

A spokesman for CSC in the U.S. declined to comment on why the company pulled out. Jim Furlong, manager of corporate communications for the firm, said, "I don't see much difference between this and what other companies are doing."

CSL Managing Director Ian Jones was quoted in the South African press as saying that the company's withdrawal had nothing to do with U.S. pressure for disinvestment. "Anything that happens with a U.S. company in South Africa today immediately has people suspecting a political move, but I don't believe that is the case here," Jones said. "CSC has chosen to invest in the development of new products and services in the U.S. rather than in [CSL]. As it is known, we did not make a profit last year."

Of a total revenue of $40 million rand in South Africa last year, CSL lost $5 million rand, the firm has said. The South African press reported the U.S. company has a $14 million rand interest in CSL, about $6 million U.S. dollars.

— **John Desmond**

A word for those who just bought a Unix system.

last week, but other issues took precedence. On Sept. 1 the South African government declared a four-month moratorium on debt principal repayments by South African companies on loans to foreign banks.

While the moratorium does not prevent multinationals from doing business in South Africa, it is a cause for concern. "The devaluation of the rand has had a very severe impact. We've had price increases in the last 12 to 18 months in excess of 60% for our users," van Vuuren said. "Users are thinking longer before making a decision."

Due to the sensitive situation in South Africa, what sources say off the record often differs markedly from comments made by official spokesmen.

The state of emergency imposed on 36 magisterial districts surrounding major South African cities has had an impact on day-to-day business. All the companies are making investments mindful of an ultimate risk. "The risk is that the whole country will plunge into civil war, and they may not get their payments," one source said.

■

U.S. high-tech firms' compliance rates high

Six U.S.-based high-technology firms were given a top rating for voluntary compliance with the Sullivan Principles, a code of conduct aimed at providing an equal opportunity for blacks in South Africa.

The six firms given top ratings in the latest report of compliance of U.S. companies doing business in South Africa were IBM, Burroughs Corp., Control Data Corp., Hewlett-Packard Co., Sperry Corp. and Xerox Corp.

Spokesmen for two of the firms said congressional and presidential approval of trade restrictions on the sale of U.S. computer technology to certain agencies of the South African government would hurt their efforts to comply with the principles.

A bill calling for restrictions, the Anti-Apartheid Act of 1985, is now being considered in the U.S. Senate.

The Sullivan Principles were drafted by the Rev. Leon Sullivan, a black clergyman from Philadelphia who became concerned about U.S. involvement with apartheid while he was a board member at General Motors Corp.

These principles call for the desegregation of "all eating, comfort and work facilities," as well as equal and fair employment practices.

Sullivan code signatories are asked to file semiannual reports that are summarized by Arthur D. Little, Inc., a consulting firm in Cambridge, Mass. The code is administered by the International Council for Equality of Opportunity Principles, Inc. of Philadelphia.

High-technology companies that received the second rating of "making progress" included Honeywell, Inc., ITT and Westinghouse Electric Corp.

Companies that received the lowest rating of "need to become more active" included Motorola, Inc. and NCR Corp., although both companies did pass the basic requirements.

"We have been doing many, many things in this country that go beyond the normal activity of selling computers," said Mias van Vuuren, general manager of South African operations for Burroughs, in an interview from South Africa. "We are spending millions per year in education and development programs for the blacks and deprived communities of the country. If any of our business volume disappears, it will make it very difficult for us to sustain the same level of community involvement.

"A cutback in our business means we will have to seriously look at what we can and cannot do," he said.

Any decision about pulling Burroughs out of South Africa would be made by Burroughs Chairman Michael Blumenthal. "It's not my decision because I'm a South African citizen," van Vuuren said. "I'd like to see Burroughs do business here for as long as we're allowed to do business. We believe our position in South Africa is a force for positive change."

Van Vuuren said he did not have a total on how much money Burroughs has spent since 1978 on community development programs, but he said the percentage increase is greater than the company's profit growth percentage year to year in South Africa.

IBM has spent more than $25 million since 1975 on community development, according to an Armonk, N.Y.-based IBM spokesman who specializes in IBM South Africa's business affairs. Of the 1,914 employees in IBM South Africa, IBM employs 99% South Africans, 15% of whom are black South Africans, the spokesman said.

IBM committed $10 million this year to a computer-assisted language lab program in the South African schools, the spokesman said. Only 11 of every 100 blacks in South Africa reach the high school level, and fewer than .05% of South African blacks have a university education, the spokesman said.

The IBM program is expected to reach some 37,000 children in five years. IBM has also obtained a commitment from the South African Department of Education to restructure the curriculum for black South African school children, the spokesman said.

"IBM has determined it will take significant efforts to bring about meaningful change in that country. Our resources are dwarfed by the problems of the country," the spokesman said.

— John Desmond

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From page 1

AT&T, Sun to converge on Unix standard

Berkeley 4.2-based systems, an AT&T spokesman said.

According to an AT&T spokesman, the agreement is precedent setting because it will incorporate non-AT&T modifications to Unix into AT&T's System V definition for the first time.

"When the System V and [Berkeley 4.2] shells are merged, all that will be part of the System V definition," the spokesman said.

The joint effort of Sun and AT&T may or may not result in a new release of Unix System V, according to the AT&T spokesman.

"We just don't know yet," he continued.

The timetable for the completion of the project is early 1986, the AT&T spokesman said.

However, a spokesman for Sun predicted that the project may require 12 to 24 months for completion.

AT&T rolls out 1M-bit chip

Full production slated for early next year

BERKELEY HEIGHTS, N.J. — Claiming a jump on widespread competition, AT&T last week said it has begun production of 1M-bit random-access memory chips that it is now offering for sampling by selected commercial customers.

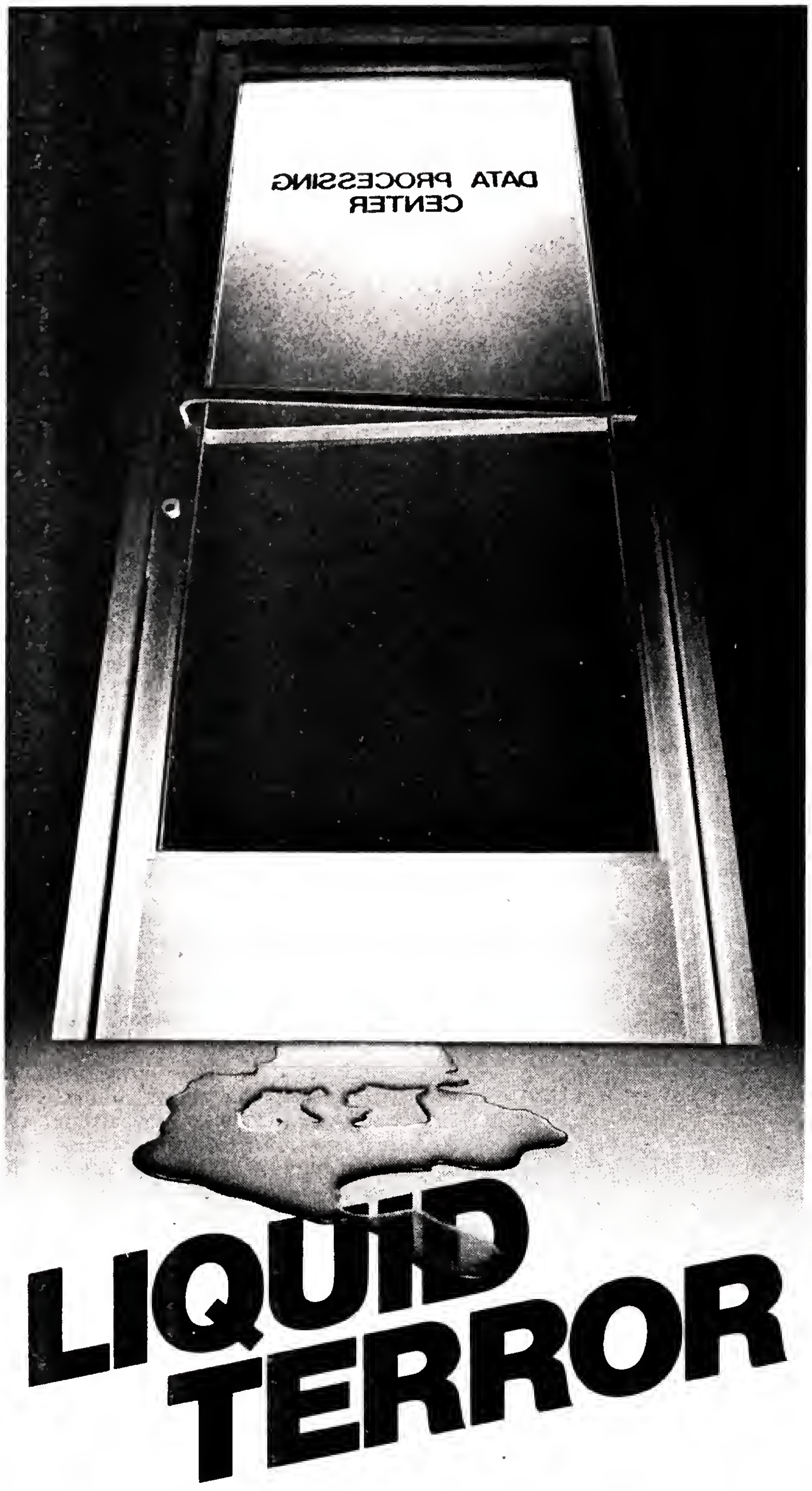
The company said it plans limited commercial production by the end of this year and full production early next year.

Several vendors have announced prototype development of 1M-bit chips, including large Japanese vendors and IBM, but AT&T claimed to be the first U.S. firm to reach an advanced stage in production.

In a prepared background statement, Bob Lucky, executive director of AT&T Bell Laboratories' Communications Sciences Research Division, said the 1M-bit chip will allow vendors to cross a threshold in the cost of silicon memory that will make feasible a whole array of new functions on personal computers.

A computer using the 1M-bit chip and a 32-bit microprocessor "has essentially all the power of today's mainframes and could someday be cheap enough and small enough to be sold as a personal computer for the home or office," Lucky said.

AT&T predicted that revolutionary developments are also likely in laptop computers because the 1M-bit chip requires less power and less physical space than existing memory chips.



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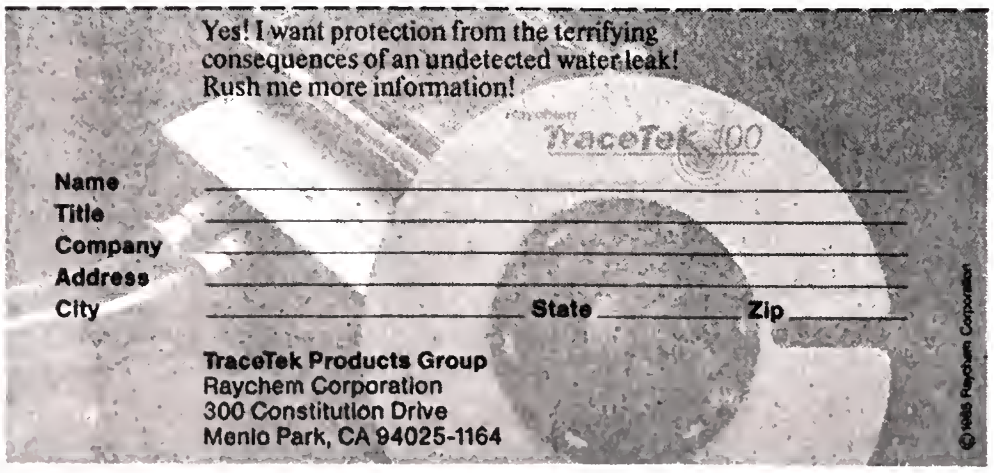

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Regulation of bulletin boards faces strong opposition

By Mitch Betts

WASHINGTON, D.C. — The American Civil Liberties Union (ACLU) and a group of computer bulletin board operators are mobilizing to fight legislation that would regulate the content of bulletin board messages, spokesmen for both groups said recently.

The lobbying campaign is a response to several recent legislative efforts to stop bulletin boards from posting computer passwords, network access codes, credit card numbers, pornography and other messages that can be used for illegal purposes.

Examples of these legislative efforts include the following:

- U.S. Sen. Paul S. Trible Jr. (R-Va.) introduced a bill (S. 1305) to make illegal pornographic bulletin boards such as "sex talk computer services" and computer networks run by child molesters who share information about their victims.
- State Sen. John Doolittle (R-Calif.) sponsored a computer crime bill (S. 1012) that would make it illegal for anyone to place a password, access code or financial account number on a computer bulletin board without authorization and would make system operators liable once they are notified.
- The computer crime committee of the Data Processing Managers Association (DPMA) is drafting model legislation that would outlaw actions that contribute to a computer crime such as posting a computer password or network access code on an electronic bulletin board [CW, July 1].

> ❞
>
> *'The technology of bulletin board systems has developed faster than the ethics.'*
>
> — **Richard Cashion**
> **Tennessee Technological University**

Jerry J. Berman, chief legislative counsel for the ACLU here, said he is urging system operators to oppose the legislation — especially the Trible bill — on grounds that electronic bulletin boards are akin to newspaper publishing and, thus, are protected by the First Amendment right to free speech.

Government regulation may have a "chilling effect" on this form of electronic publishing because it will prompt operators to censor their bulletin boards for fear of prosecution, Berman said.

Moreover, legislation that makes operators liable for the messages on their systems places a great burden on operators to monitor them, Berman said, adding that the burden may put some out of operation.

Paul Bernstein, a Chicago attorney who runs a bulletin board, agreed. He said politicians are moving too fast with the legislation without understanding the technology, the beneficial uses of bulletin boards or the burdens of monitoring the systems.

Bernstein said he and other system operators plan to revitalize the National Association of Bulletin Board System Operators so it can lobby Congress and perhaps draft a code of ethics.

In response, an aide to Trible said there is no constitutional protection for obscenity, and Congress frequently has outlawed the use of interstate communications facilities for criminal purposes.

A hearing on S. 1305 is scheduled for Oct. 1, the aide said.

Supporters of the computer crime legislation said it is needed to curb a rash of computer trespasses caused by hackers who obtained access codes and passwords from underground bulletin boards [CW, June 24].

"The technology of bulletin board systems has developed faster than the ethics," commented Richard Cashion, who is drafting the DPMA bill and who is assistant DP director at Tennessee Technological University in Cookeville, Tenn.

Donald G. Ingraham, an assistant district attorney in Alameda County, Calif., said he strongly supports the Doolittle bill, which recently passed the state Senate and is pending in the Assembly's Committee on Public Safety.

"Our main point is that we are dealing with the misuse of stolen property [such as passwords and credit card numbers]. There is no First Amendment protection for criminal activity," he said.

John T. Vanadia, a spokesman for the EDP Auditors Association, said he supports tough legislation.

"The security responsibility of DP managers is difficult enough even without these bulletin boards passing on passwords and access codes," he said.

In a related development, the California legislature is studying a proposed state constitutional amendment (ACA. 9), sponsored by Assemblywoman Gwen Moore, that would guarantee the freedom to communicate electronically on all subjects. The ACLU-supported amendment also would protect against unwarranted search and seizure of personal information stored in information systems.

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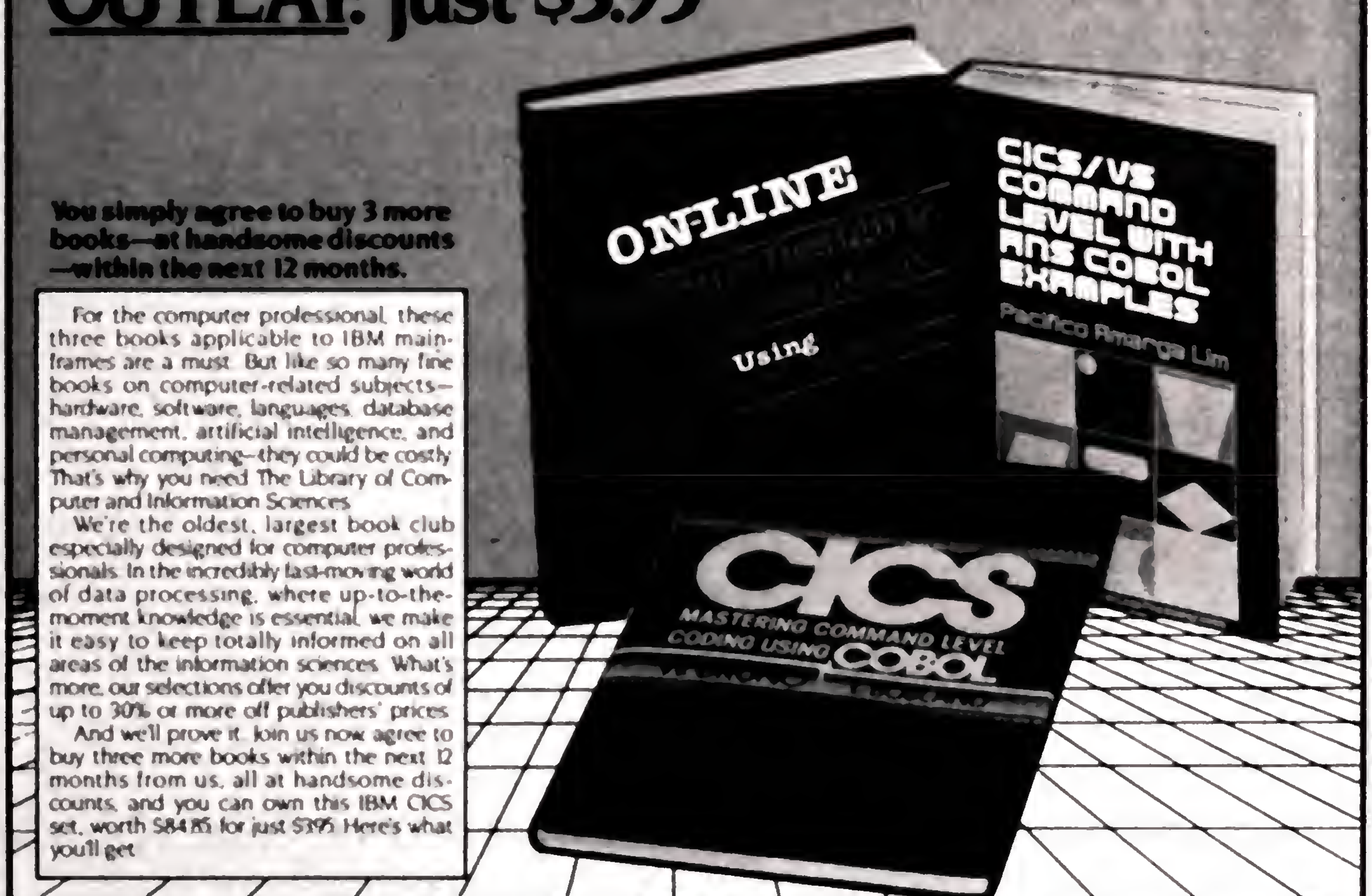
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Computerworld 9/9/85

Government DP costs plateau

Outside vendor services to consume half of budget

By Mitch Betts

WASHINGTON, D.C. — Just as in the private sector, expenditures for computer technology by the U.S. government have reached a plateau after years of increasingly heavy spending, according to figures recently released by the U.S. Office of Management and Budget (OMB).

A new OMB report said the federal information technology budget rose sharply by 13% a year between fiscal 1982 and fiscal 1985 when the figures are adjusted for inflation. But the inflation-adjusted budget will remain constant — at $13 billion — between fiscal 1985 and fiscal 1986, the OMB said.

The flattening DP budget, however, hides an important trend: The government increasingly gets its DP and telecommunications services from outside vendors. By fiscal 1986, almost half of the federal DP budget will be owed to commercial services, the OMB said.

Perhaps because of this move to commercial services, the size of the government's in-house DP work force is growing slower than in the past and will increase only 1% between fiscal 1985 and fiscal 1986, the report said.

In a departmental breakdown, the OMB report showed that the U.S. Department of Defense continues to dominate the federal DP budget. The department plans to spend $7.7 billion in fiscal 1986 (in current dollars), about half the federal budget for information systems.

The OMB figures indicated that information systems represent 1.6% of the total budget of the U.S. government. "While it has become a cliche to observe that the federal government is an information enterprise, it is important to realize that many federal programs simply could not operate without effective technology support systems," the report said.

The observations came from "A Five-Year Plan for Meeting the Automatic Data Processing and Telecommunications Needs of the Federal Government," an OMB report that is more a compendium of DP management strategies and statistics than it is a five-year plan.

The report discussed the value of information systems planning and security programs, the need to improve management over software maintenance and end-user computing and the need to respond to new computer technologies and the rapidly changing telecommunications marketplace.

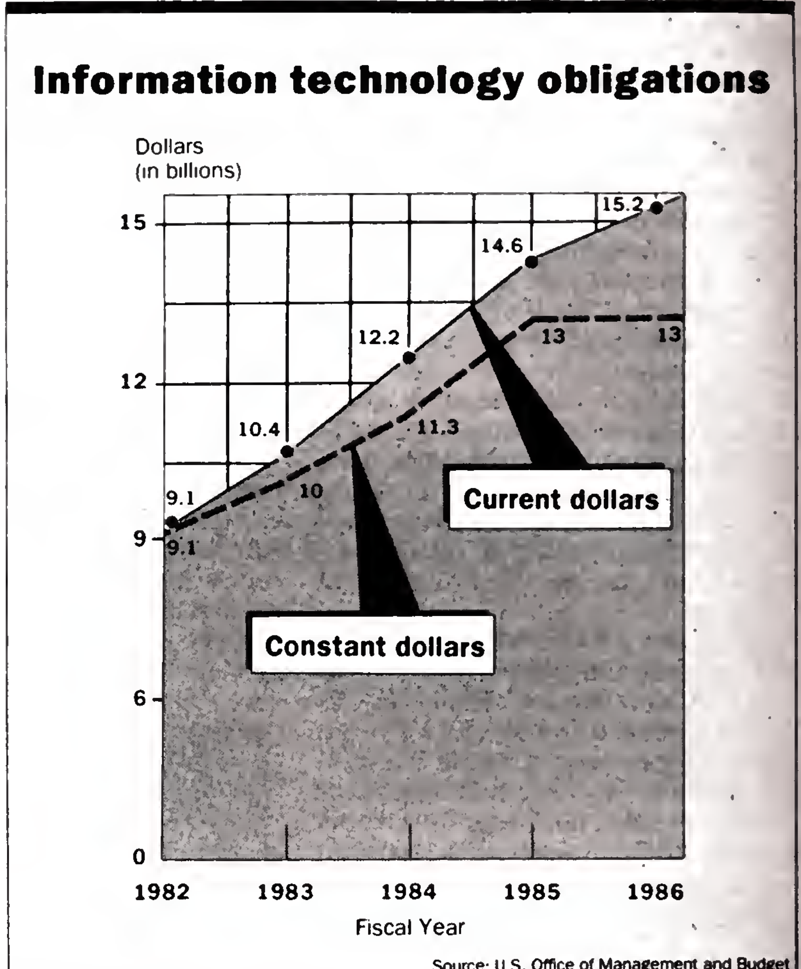
One OMB strategy is to encourage agencies to use commercial, off-the-shelf software rather than custom-developed programs to save on software development and maintenance costs [CW, Feb. 25].

The OMB also said it will give extra management scrutiny to eight major government DP projects, such as the Patent and Trademark Office's automation program and the Social Security Administration's modernization program.

A separate report — the federal DP inventory published by the General Services Administration's Federal Equipment Data Center — said that in fiscal 1984 the U.S. government owned or leased 206,512 items of DP hardware, valued at more than $6.7 billion. However, this inventory counts only items that are components of computer systems costing more than $50,000, thus omitting minicomputers and micros.

By dollar value, Sperry Corp., IBM, Control Data Corp., Honeywell, Inc., Digital Equipment Corp. and Burroughs Corp. were the largest suppliers of DP equipment to the government, in that order.

CW CHART BY MITCHELL J. HAYES



Source: U.S. Office of Management and Budget

The Office of Management and Budget projects a flat rate of expenditures for data processing.

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Census Bureau counts 1984 hardware shipments

By Mitch Betts

WASHINGTON, D.C. — Nearly 88% of the digital computers shipped in 1984 were priced at less than $2,500, but that 88% accounted for only 28% of the total value of computer shipments, according to statistics from the U.S. Bureau of the Census.

Sales of large computers — retailing for $1 million or more — had a value of more than $1 billion but represented less than 1% of the number shipped, the Census Bureau reported.

The figures are from a recent Census Bureau report that, for the first time, provides production statistics on general-purpose digital computers by retail price categories. The large number of inexpensive computers highlights the growing influence of microcomputers in the computer industry, noted Stephen Pope, the analyst who prepared the report.

The report showed that while the total value of computer shipments increased by 35% from 1983 to 1984, quantities shipped increased less than 1%, to 4,157,513 units.

Value of peripherals shipped up 13%

The total value of peripheral equipment shipped in 1984 was $18.9 billion, up 13% from the previous year, the report added.

The bureau also reported the following:

- Shipments of general-purpose computer terminals remained relatively constant from 1983 to 1984, valued at roughly $2 billion in both years.
- Shipments of point-of-sale terminals and funds-transfer terminals together were valued at $871.3 million in 1984, an increase of 14% from 1983.
- Shipments of automatic typing and word processing machines were valued at $1.9 billion in 1984, an increase of 21% from 1983.
- The value of magnetic tape drives shipped in 1984 was $882.6 million, up from the 1983 level of $772.3 million. Likewise, the value of magnetic tape shipped in 1984 was $204.4 million, up from $116.8 million in 1983.
- The value of disk drives shipped in 1984 was $4.9 billion, up from the 1983 level of $4 billion. The value of both rigid and floppy disks shipped in 1984 was $1.6 billion, down slightly from the 1983 level of $1.7 billion.
- The value of computer printers shipped in 1984 was $1.7 billion, down from $1.9 billion the previous year.

Copies of the Census Bureau report, "Computers and Office and Accounting Machines, 1984 (Current Industrial Report Series MA35R)," are available from the U.S. Government Printing Office in Washington, D.C.

Bureau tallies robot 'births'

By Mitch Betts

WASHINGTON, D.C. — The U.S. Bureau of the Census, after nearly 200 years of counting people, has counted the number of robots "born" in the U.S. for the first time: 5,535 robots in 1984.

The new report said 75 companies shipped that number of complete robots in 1984, at a value of $306.7 million.

The automotive industry is the primary customer of industrial robots, and the report showed that the single largest category of industrial robots were those used for welding, soldering, brazing and/or cutting. Shipments of these units totaled 1,454, or 27% of all robots shipped, the Census Bureau said, adding that their value was $124.2 million.

In other categories, the report said that 450 robots used to spray, paint or glue materials were shipped last year, at a value of $58.8 million. Also, 613 assembly robots were shipped, with a value of $29.1 million.

Before the Census Bureau survey, robot statistics were either estimates by industry analysts and consultants or statistics compiled by the Robotic Industries Association (RIA) of Dearborn, Mich.

Donald Vincent, RIA executive vice-president, said he welcomes the Census Bureau effort because it is the first step toward government recognition of the robot industry. He said the government census is the first procedural step required for the U.S. Department of Commerce to assign the industry a Standard Industrial Classification code in 1987.

RIA statistics showed that 3,060 robots were shipped in 1983 at a value of $194.4 million [CW, Dec. 17], and 5,136 robots were shipped in 1984 at a value of $332.5 million.

Although the Census Bureau and RIA figures for 1984 are similar in magnitude, the Census Bureau said the number of shipped robots was 399 units higher than the RIA estimate.

Copies of the Census Bureau report, "Robots, 1984 (Current Industrial Report Series MA-35X)," are available from the U.S. Government Printing Office in Washington, D.C.

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EDITORIAL

The Japanese 'problem'

When the going gets tough, the tough get . . . ugly.

The recent descent into name-calling and creative number crunching by U.S. and Japanese semiconductor trade groups has not been a pretty sight. When the slogan "red herring" resurfaced late last month in a countercharge from the Electronic Industries Association of Japan (EIAJ) against the U.S. Semiconductor Industry Association's (SIA) allegations of chip trade imbalance, it stirred up some unpleasant memories. How odd to hear the Japanese high-tech high flyers of the 1980s echoing a slogan from the U.S. political witch-hunts of the 1950s.

The increasingly bitter semiconductor trade battle heating up headlines in the business and trade press is more of a symptom than a problem in itself. The real problem, obviously, is the industry slump, which has prolonged and intensified the downward curve of the chip industry's roller coaster business cycle.

Just a few short years ago, when the chip foundries of Silicon Valley were churning out 64K-byte dynamic random-access memory (RAM) circuits to feed a demand then perceived to be insatiable, Japanese vendors simply shared in the wealth. There was competition but more in the sense of who could cut the next slice from an ever-expanding pie.

When demand slowed and advancing technology rendered simple RAM chips into off-the-shelf commodities, Japanese manufacturers did what they do best. They boosted their legendary high-volume, low-cost production lines and turned out cheaper semiconductors.

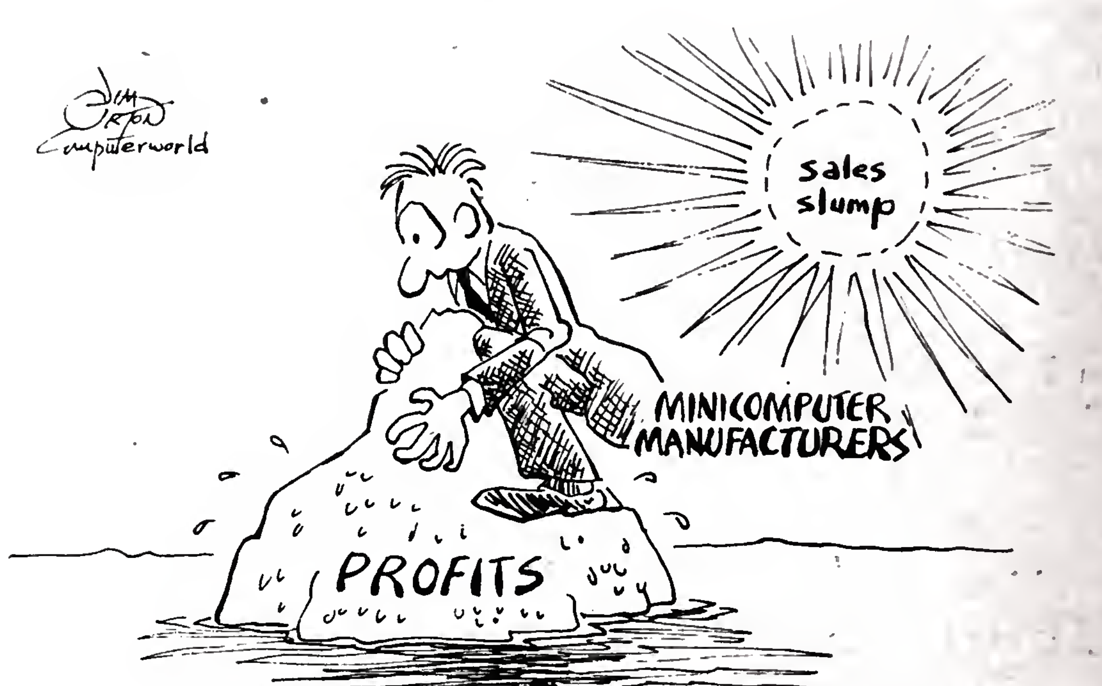
The U.S. companies have learned some painful lessons as the pie has shrunk, but much of the learning has come too late. Some important omissions include the failure to adapt to a commodity marketplace, overly aggressive capacity expansion and a tendency to continue milking a current, and declining, demand while neglecting to anticipate trends in end-user needs.

Times are extremely tough in the semiconductor business, but Japanese chip vendors have hardly been the cause; the basic law of supply and demand deals out penalties when manufacturers dwell on only the supply half of the equation. And now, even more important, restrictive trade actions, whether they increase U.S. chip sales in Japan or cut Japanese market share here, are not going to be the cure.

The current SIA-EIAJ dispute over market share figures is a simplistic approach to a complex industry — one in which distinctions between which products are American and which are Japanese, ordinarily a point of xenophobic pride, are becoming more blurred every day.

To cite just three examples, this is a world in which National Semiconductor Corp.'s National Advanced Systems subsidiary sells Hitachi Ltd. mainframes with an NAS label; RCA Corp. and Sharp Electronics Corp. have plans to build jointly Cmos chips in the state of Washington; IBM is about to complete an agreement with the government of Japan that will ease Big Blue's access to the research fruits of its Japanese cross-licensing partners.

In such a context, the angry voices of the semiconductor trade groups on both sides of the Pacific ring hollow. We safely presume that a semiconductor industry rebound, if and when it comes, will render those voices happily mute. Until then, we recommend silence and good works aimed at the corrective management steps that will facilitate that rebound.



Tip of the iceberg

LETTERS

Hawaii cited as ideal exporting location

I fear for the future of the U.S. high-technology industry when I read of large-scale layoffs at many U.S. high-tech firms, The slowdown in the computer industry seems to have hit many larger firms with unsold inventory and manufacturing excess capacity.

Yet for many small- and medium-size companies, rapid growth is still possible, especially in high-tech exports to the second largest computer market in the world — Japan — and the world's fastest growing computer market —. Southeast Asia. There are also the newly industrialized Four Dragons: Taiwan, Hong Kong, Singapore and South Korea — all booming markets.

However, many U.S. firms don't think of exporting at all, deciding that it is next to impossible to market products to Asia half-a-world away. Hawaii, though, has been overlooked as the perfect size for marketing to Asia.

The Hawaii High-Technology Council was formed last year with state government and private sector support to aid U.S. companies that are investigating Asian marketing from Hawaii.

Ray K. Tsuchiyama
Honolulu

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VIEWPOINT

On students, computers and the Soviets

LECHT ON SCIENCE
Charles P. Lecht

U.S. universities that have taken in a supercomputer as well as some Soviet graduate students may soon regret having done either or both. Department of Defense and other national security officials are being quoted in the overseas press, warning universities to be wary of their Soviet pupils. If students are studying science and are given open research access to our supercomputer systems, we are told that we must be especially careful. We must worry that some might, in the course of their studies, use these very same devices on behalf of the defensive — or even offensive — efforts of their home land. And that access by the students leaves our supercomputer facilities open to sabotage or espionage.

Reputed to be far behind the U.S. in computer technology and, at the same time, considered to be the foremost threat to U.S. national security, the Soviet Union presents us with motive for much of our defense program. For the past few years, schools like MIT, Brown University, New York University and Cornell University have been the recipients of new supercomputer systems, and with these, they have received various governmentally sponsored research grants related to defense. Therefore, it is not surprising that the issue of how to handle graduate students in science from the Soviet Union at schools such as these has come to the fore.

One precaution suggested by U.S. government officials is to ban Soviet graduate students from using university supercomputer facilities. The question is whether this is needed — forget about whether it is fair while their companions in the same courses from the U.S. have essentially unlimited use.

I do not believe that the Soviet students who have come here to do scientific research with supercomputers should be prevented from doing so because we fear that they might be running Soviet military applications instead of homework. This suggests that the Soviet Union is not worried about our survelliance of its results, or that they have a need to process work because the Soviet Union hasn't got supercomputers of its own.

If the Soviet Union lacks supercomputers, I'd like someone to explain how it developed its nuclear and space technologies. I've never believed it was behind the U.S. in the manufacturing and use of the kinds of logic and memory devices we use in our most vital defense areas — there are just too many signs to the contrary. From *Sputnik* to *Suyouz* to the hydrogen bomb, the Soviets have managed to come up with some fancy results, none of which could have been achieved without supercomputers.

Back to sabotage and espionage. Doubtless there is always the possibility of either from the students, but it is far less likely to occur from them than from trained experts in these nefarious arts. We need not be ashamed to warn all students, Soviet and American, of the penalties for becoming so engaged. And foreign students from countries that are not U.S. allies must be especially careful to avoid even the slightest appearance of involvement in such events.

So what about everything we read in the papers on the theft of our technology by the Soviets? Doesn't it mean that they lack our inventions? Why else would they be buying these through less than savory channels or even stealing them? Rather, it seems far more logical that they have been actively seeking our technology because in it is contained, at minimum, the message of where we are in the world of science and, at maximum, the secrets of our capabilities and limitations. This kind of information pieced together with other facts, such as which of our defense facilities are using a specific technology, can go a long way toward planning counter measures and those more aggressive. I'd be really disappointed if we weren't engaged in the same — forewarned is forearmed.

It cannot be viewed as anything but intelligent leadership that our defense and security establishments saw fit to outfit some of our universities with supercomputers and to support their development and application by providing research grants. If brains cannot be found in our leading academic institutions, then where else? It is only natural that we must take measures to protect the results from people who may do us harm. This can be best achieved by implementing systems security features, including those that preclude access to data bases and programs. Supercomputers are known to be super at such tasks as these. Faculty monitoring of the use of the systems is also in order, but I suspect this might be too much to ask. The unauthorized use of university computer facilities by faculty for personal reasons has always been nothing short of scandalous.

But, let's not get carried away by banning, not to speak of expelling, our Soviet students. We don't need another episode like the 1950s when suspicion of foreign students was followed by suspicion of their professors. The arrival of students from abroad is a positive step in the preservation of our way of life. Sure, there will always be a bad apple or two in the lot, but that's unavoidable. Most will go home after their training with fond memories of the fairness and freedom they found in the U.S. And that's just about the best conflict deterrent I can think of.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Maintaining morale when the contractors enter

THE DATA CENTER
John P. Murray

Many installations find that they must enlist the services of contract programmers to satisfy expanding demand. It is unfortunate that in some instances, while the contractors may do a very good job, because of the way their services are used, considerable harm can be done to the morale of the systems and programming staff.

It is not uncommon to find a situation where a new, unplanned system is required immediately. To respond to this demand, the management of the installation will review the work in progress and discover that all members of the systems and programming staff are fully committed to already approved projects and maintenance work. Given that situation and considering the need to begin the work immediately, the logical answer is to hire contractors.

So far, so good. The harm to morale does not usually arise with the introduction of contractors but with the assignment of duties once the contractors have arrived. Often the stance of the department management is that these people are expensive, that they have considerable experience and skills and that they will be best used on the new development project. Sounds logical, even reasonable.

Although that may be a very pragmatic approach, let's consider the effect it has on the members of the systems and programming staff, particularly those who are in charge of maintenance.

Application system maintenance, right or wrong, is often viewed as work that is less than desirable. It is often the case that those who have this responsibility accept it with reluctance and are eager to move to the development area. Given that scenario, it is easy to see the negative impact on morale when new people, who are not even employees, are brought in and assigned to more desirable work.

Because adopting the approach of the assignment of development work to the contractors sends negative signals to staff members, the adverse effect on morale is understandable. Sometimes managers will seek to justify this assignment of duties by saying that these contractors have prior experience on similar projects and can, therefore, do the job more rapidly.

It may also be stated, unfortunately, that the contractors are too expensive to be assigned to maintenance work. That position should tell everyone something about the feeling toward maintenance in that installation.

There have even been instances where management has stated that the contractors are unwilling to work on maintenance, and the only alternative available is to assign them to the development project. Clearly, in that situation, something is wrong. Either the management is so weak that it is unable to control the contractors, or it is simply a case of lying to avoid facing the issue. In either case, that installation has far more serious problems than those of dealing with contractor assignments.

The use of contractors can be effective while morale within systems and programming can be maintained if a different approach is taken. If it is necessary to bring contractors into the installation, they should, wherever possible, be assigned to work in the maintenance areas.

One exception would be in an enlightened installation where maintenance is understood to be a necessary and valuable component of the entire information processing function. In such a place, people with maintenance assignments are likely to be very satisfied with their work and probably will not want a different assignment. In that case, assignment of the contractors to the new projects will not create problems.

The idea that contractors are more experienced and that they can complete development work more rapidly may be quite valid. The problem is that using such an approach stifles the growth and development of the people within the installation.

In those departments where development work is considered to be the ultimate, the result will be a lowering of morale, a growing tension within the systems and programming section and ultimately an increase in turnover within the department.

Careless handling of the introduction and use of contract programmers can lead to more harm than good. As they press to attack the problems of an increasing work load, information processing managers must be aware of the needs and concerns of the staff.

To be effective, management must be carried out so that all staff members view it as being fair and even-handed. The most effective use of the contractors may not be the best approach in the long run.

Murray is director of management and information services for American Breeders Service, a DeForest, Wis., division of W. R. Grace & Co. and is the author of Management Information Systems as a Corporate Resource.

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Today's MIS managers seen as facilitators of change

READER'S PLATFORM
John J. Connell

Traditional wisdom has it that computers and their use in MIS represent a mature technology supported by a substantial industry infrastructure that is conservative, slow moving and structured. Work is handled in an orderly way by professionals, caution is the watchword, and the boat is seldom rocked. But that was yesterday.

Today, the only constant in the world of computers and MIS is change. The challenge to those in the information field is to recognize and understand these changes and then to adapt to them. The challenge to general management is to facilitate that process of adaptation.

What are these changes? New machines, new systems, new approaches? Yes, all of these, but the basic underlying change is the move of computing and other technological capabilities out into the workplace. It is that phenomenon and its ramifications that will dominate the world of information technology in the years ahead.

Minis started the move

The move started with the introduction of minicomputers that offered an alternative to large data centers as a source of computing power. The term "distributed data processing" was coined to describe this development. In actual practice, however, minicomputer installations became small data centers managed by technical specialists, operating in parallel with and sometimes connected to large data centers.

The advanced office systems field continued the trend. It introduced word processing, electronic mail, teleconferencing and other capabilities for nonspecialists. In the process, it changed the face of the information technology world and enlarged beyond measure the number of people who use such capabilities as part of their regular work.

However, the advanced office systems field has been slow in developing. One can point to many success stories, but overall, the field has not yet lived up to its potential. Nevertheless, advanced office systems represent a major thrust to move technology into the workplace. The pace of that change has accelerated greatly with the advent of micros.

It is important to recognize that the driving force behind the introduction of microcomputers has not been the information technology community. Rather, it has been nonspecialists who want computing capabilities available at their fingertips. In many cases, micros are being introduced over the objections of information technology professionals, but, as legitimate as some of those objections may be, there is no holding back the tide. Knowledge workers need these machines to do their jobs effectively, they recognize the need, and they insist that their needs be met.

This development is a basic change in direction in the information technology field and calls for a reexamination of the philosophical underpinnings of that field.

There are two reasons for introducing machines into the office: The first is to streamline processes, and the second is to improve one's ability to compete.

Over the years, the data processing field has been concerned with the streamlining of processes — improving the handling of high-volume transaction-based systems, reducing the cost of maintaining large files, speeding up the production of reports and similar activities. Conversion of such activities to machines produces measurable, predictable

Continued on page 21

Connell is executive director of the Office Technology Research Group, headquartered in Pasadena, Calif.

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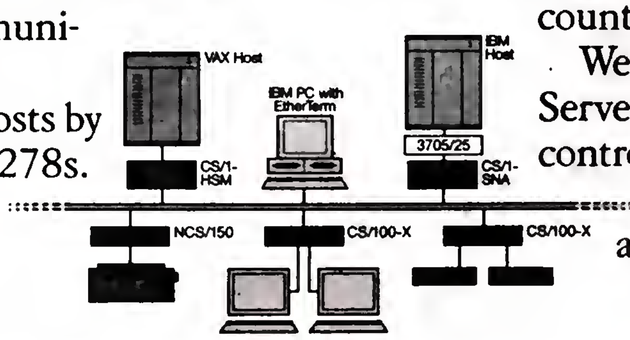

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VIEWPOINT

LETTERS

Datapro poll clarified

I would like to clarify some points in the article "Poll shows mini mart saturated" [CW, July 22].

According to Mary Heminway, managing editor of Datapro Research Corp., the survey was not given to all minicomputer manufacturers simply because they produce minicomputer systems. The criteria used for selecting minicomputer manufacturers was based on hardware technology and target markets.

Motorola/Four-Phase Systems, Inc.'s 4000 and 5000 series have traditionally been targeted at the distributed data processing market. The company had not announced any new minicomputer hardware technology recently. Therefore, Datapro did not feel that Motorola/Four-Phase matched the selection criteria.

Datapro classified the Motorola/Four-Phase 2000 and 6000 series as superminicomputer systems, and thus these did not match the selection criteria as well.

It appears that the elimination of Motorola/Four-Phase from the survey was based solely on Datapro's survey objectives and not on the viability of the minicomputer systems.

Howard Amundsen
Cupertino, Calif.

Publisher lauds vendor

A reader might infer from the article, "Switch to in-house data base musters interest in DSS" [CW, June 24] that Thomas Publishing Co. is unhappy with its service bureau vendor, when actually the opposite is true.

For the past 13 years, our vendor, International Computaprint Corp. (ICC) of Fort Washington, Pa., has consistently provided excellent service and continues to give valuable guidance in automating our operations. In fact, ICC has assisted us immeasurably in our efforts to perform work in-house, and it will continue to perform many other functions for Thomas that it alone does best.

Albert W. Klein
New York

From page 20

Today's managers facilitate change

gains with low risk of failure.

Return on investment is not easily measured, and risk is high. Yet it is these investments, ultimately, that determine the fate of an enterprise. One can be streamlined to the nth degree and still fail if the right competitive investments are not made.

In this light, then, what is the new role of information technology professionals, MIS managers and the like? Their role is to make it happen and to provide an operating and technological atmosphere that supports the move of technology out into the workplace. This constitutes the new role of MIS professionals — facilitators rather than the exclusive providers of services.

In fact, some corporations have already responded by splitting their MIS organizations into two groups: One group aggregates all functions concerned with the operation of large, transaction-based processing systems and the maintenance of central data bases. The other group aggregates all activities concerned with moving technological capabilities out into the workplace. The managers of both are equal in rank and stature.

Change is never easy. Coping with major changes in direction, job content and career paths is doubly difficult. Couple that with a world that is exploding with new technological developments, and the situation becomes almost impossible.

Every change, however, represents an opportunity. Investments in advanced office systems will produce a community of office workers who are comfortable with information technologies and are aware of their potential.

That knowledge will then be translated into new ideas and approaches for improving overall corporate performance. Rather than the resistance often encountered in the past, MIS professionals will find themselves hard-pressed to keep up with this knowledgeable user community, and the challenge of their profession will grow immeasurably.

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SURVIVAL STRATEGY FOR SERIOUS DATA: PC/T

Integration under MVS/XA forecast for IBM line

By Donna Raimondi

IBM will adopt an integrated architecture across its extensive product line that will function under its MVS/XA operating system, according to a recently published report.

A heavy dependence on IBM's VM/CMS environment will provide interface capabilities for end users, according to "Inside Sierra," the report produced by Applied Management Services, Inc. of Patchogue, N.Y.

Within five years, the MVS/XA operating system will be modified to minimize user compatibility and migration problems, the report said.

The report examined IBM's Sierra announcement as part of an effort to provide data processing managers with an in-depth technical and managerial briefing on the 3090 (Sierra) systems. IBM's 3090 Model 200 and 400 announcements last February are the most significant factors contributing to the planning concerns of IBM mainframe users, the report said.

Since the 3090 announcement, high-end 3080 users have feared being stuck with suddenly old and hard-to-sell 3080 machines, the report said. The overall message in the 3090 announcement was IBM's hope that users would continue to purchase 3080 series processors. Despite its claims to the contrary, however, IBM is moving away from the 3080 mainframe family.

Lesson learned from 4300, 3080 era

IBM learned a lesson during the 4300 and 3080 series era, when its announcements of the new systems destroyed 370 and 3030 series residual values almost overnight. To avoid doing that to the 3080 series, the company held back announcements on the 3090's actual capabilities, the report said. IBM also dropped prices on 3080 series machines to promote their purchase.

During the next 18 months, overall internal performance of the 3090 Models 200 and 400 is expected to increase by 20%, the report predicted. Main memory capacity will increase, while the cost per megabyte of that memory will be reduced. Applied Management Services expects IBM to announce three new 3090 models by mid-1986, including two single-processor models and one that is halfway between the Model 200 and 400 in price and performance.

The report advised users to heed the following critical migration issues in relationship to IBM's 3090 announcement:

- Consider that the 3080s cannot be upgraded to the 3090s.
- Plan a move toward MVS/XA if future plans include 3090 technology.
- Pay attention to the functional changes that the 3090 contains. The real system price/performance level may be more important than the million instructions per second rating.
- Note that the 3090 offers up to 2.9 times the scientific and engineering power of the 3081 Model KX.
- Analyze total combined life cycle costs, including maintenance, floor space, upgrades and future enhancements.
- Note that the purchase-to-rental ratios for the 3090 series are extremely low — at unprecedented levels for IBM.

> ”
>
> *During the next 18 months, overall internal performance of the 3090 Models 200 and 400 is expected to increase by 20%.*

- Strive to formulate 3080 vs. 3090 plans as quickly as possible.

Plug-compatible manufacturers (PCM) have suffered in the past few years from user loyalty toward IBM, the report continued. National Advanced Systems Corp. (NAS), however, responded to the 3090 announcement so swiftly with its family of AX/SL mainframes, manufactured by Hitachi Ltd., that it may make inroads with users who do not want to wait until 1987 for the 3090 Model 400.

NAS offers better delivery schedules, more competitive price structures and more advanced technologies than IBM in this case, the report said. Even the most conservative of large IBM users may find it difficult not to take advantage of the NAS mainframes, it said.

IBM, however, has seriously cut into the PCMs' market share with hints of a new modular MVS/XAA operating system that will not run on PCM equipment, the report said. The XAA concept centers on the implementation of microcode support, or assists, to the XA capability.

The PCMs' market share has dropped from 6% in 1981 to 4.5% at the end of 1984. As IBM moves closer to attaining the XAA microcode, the PCMs will be in for an even tougher time, the report said.

The report, which costs $120 per copy, is available from Applied Management Services.

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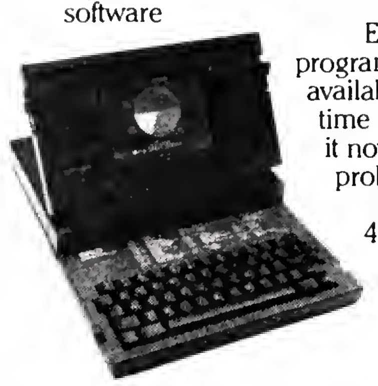

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WASHINGTON UPDATE
CW Washington Bureau

OTA to study computer security, privacy issues

WASHINGTON, D.C. — The U.S. Congress' Office of Technology Assessment (OTA) recently announced plans to conduct a study of computer security and privacy issues.

The study, tentatively titled "New Communication Technologies: Implications for Privacy & Security," will delve into the following topics:

- Current technologies for monitoring the work of government and business employees, as well as technologies being developed that are likely to intrude on workers' privacy.
- The methods for mitigating the privacy threat of work monitoring through technology, legislation, labor agreements or other means.
- The ways in which computer systems can be misused or exploited by interception of data signals, unauthorized access and other means and the availability of security measures now and in the future.
- Case studies of specific computer systems whose disruption would be significant to the public or the economy.

GAO reports find federal payment systems faulty

WASHINGTON, D.C. — Several U.S. agencies often pay contractors twice for their goods and services, in part because their automated payments systems fail to stop the issuance of duplicate checks, according to three investigative reports by the U.S. Congress' General Accounting Office (GAO).

Recent GAO studies discovered more than $11 million worth of duplicate payments, the largest involving a $6.8 million payment that was mistakenly sent twice to a contractor for the Defense Logistics Agency.

Errors often occur when contractors send two or more invoices to the government; usually the contractors return the overpayments, the reports said. But the GAO identified several problems with the automated payment systems, including the following:

- A U.S. Department of Justice system "did not reliably identify duplicate payments, and it required action by payment center staff to stop those it did detect."
- The system at a General Services Administration office identified duplicate payments but only after the final computer tape for issuing checks had been made.
- A Defense Logistics Agency office sometimes paid contractors twice, once manually and once through the automated system, because the manual payment was not recorded.

ICCP announces certifying exam

DES PLAINES, Ill. — The Institute of Certification of Computer Professionals (ICCP) has announced the Associate Computer Professional exam, a certification program for computer professionals who have graduated with degrees in computer science or who have equivalent experience.

The certification requires passing a two-part examination. The language portion tests a person's knowledge of Cobol, Fortran, Pascal, C, RPG or structured Basic. The second portion examines a person's knowledge of data and file organization, principles and techniques of programming, interaction with hardware and software, quantitive techniques and systems analysis and interaction with people.

For more information, ICCP is located in Suite 268, 2200 E. Devon Ave., Des Plaines, Ill. 60018.

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WORLD DIGEST

CW International News Network

NORTH ROCKS, Australia — Rexona Pty. Ltd., a subsidiary of the Unilever Group, has obtained the first Australian license for Cincom Systems, Inc.'s Ultra Mantis fourth-generation operating system. John Greenlees, information services manager for Rexona, said the company chose Ultra Mantis to run on its Digital Equipment Corp. VAX 11/780 "because the systems are data driven."

■

COBURG, Australia — Kodak Australasia Pty. Ltd. will install data base and development tools from Applied Digital Research, Inc., (ADR) in keeping with Kodak Corp.'s mandate to standardize its organization's software worldwide. The ADR products — Datacom/DB, Datadictionary, Dataquery and Ideal — were chosen after an evaluation by a multinational task force commissioned by Kodak's Information System Management Council, a group of senior DP managers from Kodak's eight main DP installations around the world.

■

BROADMEADOWS, Australia — Ford Motor Co. of Australia Ltd. has signed a $7.5 million contract with Burroughs Corp. Industry insiders said it is the first of two such orders Ford will ink this year to cope with on-line real-time data base software development. The company will become the second Australian user of Burroughs' A 15 mainframe. Ford of Australia now uses dual B7900s, dual B7800s and an A 9 mainframe. The Ford of Australia contract calls for three subsystems of Memorex Corp. B9494-12 thin-film head disk assemblies.

■

HONG KONG — Stockbroker James Capel has placed a computer systems order worth $2.26 million with Hong Kong consulting company CCF Ltd., whose Fiscal package will be used on the central shared resource computer facility in the stockbroker's Exchange Square complex in Hong Kong. In London, however, Capel will install the software on a 150-terminal Ultimate Corp. system, which is considered one of the largest of its type in the world. The company is the first in Hong Kong to buy CCF's Fiscal International software. It will use 10 lines connecting its office to the Exchange Square system to service Capel's activities in Hong Kong, Tokyo and Singapore.

The CCF Fiscal software will provide settlement, valuation and fund management for its London, New York and Channel Islands, UK, offices. The London installation is valued at $1.76 million and will be based on Ultimate-/Honeywell, Inc. processors with 2M bytes of main memory and 2G bytes of disk storage. The system's 150 terminal devices will include laser printers and IBM Personal Computers, a company spokeman said.

■

HONG KONG — The Royal Hong Kong Jockey Club (RHKJC) is spending $5 million to train its staff as part of an office automation project with Digital Equipment Corp. The RHKJC is currently DEC's largest customer site in Asia with over 7,000 terminals and other peripheral devices to support its gambling operations. More than 100 of the club's off-track betting centers, plus a computerized telephone betting system serving 300,000 customers, are supported by some 110 VAX and PDP-11 computers. The RHKJC was also the first Asian site for DEC's high-end Venus system, according to a company spokesman.

■

HONG KONG — Smaller hotels in the Hyatt Regency chain, including one on the Pacific Ocean island of Saipan, plan to install a financial management system developed in Hong Kong. Hyatt hotels in Indonesia; the Philippines; Dubai, U.A.E.; Fiji; and New Zealand are expected to install FMS/PC, the multicurrency package launched in March by Hong Kong-based software house RCP Consulting Ltd. The package is a microcomputer version of RCP's Hotel Accounting System for minicomputers.

■

HONG KONG — Technical trials for an integrated services digital network, capable of carrying data, text and color-image communications, are scheduled for later this year by the Hong Kong Telephone Co. The territory's 66 telephone exchanges will all have digital switching by 1988.

■

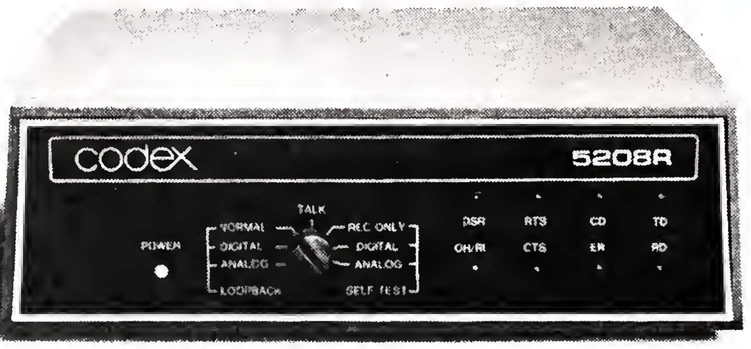
OSLO — The Osborne label will reappear on computers, but the new IBM Personal Computer XT -compatible Osborne system will be available only in Norway, it was learned. The Norwegian computer distributor, Nor Sales, was extremely successful three years ago with the original Osborne Computer Corp. portable computer.

When Osborne ended operations in the U.S., Nor Sales sold off the machines at low prices. The new "Norwegian" Osborne 20 XT is actually a U.S.-made Tandon Corp. computer, selling for about half the price of an IBM Personal Computer XT.

■

STOCKHOLM — Losses incurred by its personal computer division in the U.S. market are being blamed for Ericsson Information Systems, Inc.'s (EIS) recent financial woes. EIS invested heavily to penetrate the U.S. market but had very poor results, sources said.

Estimated sales for this year were reduced from 15,000 units to 6,000, and EIS has been forced to cut the micro's price by 15% to 20%. Ericsson recently reorganized its Information Systems division, reduced personal computer production and may relocate its manufacturing unit.



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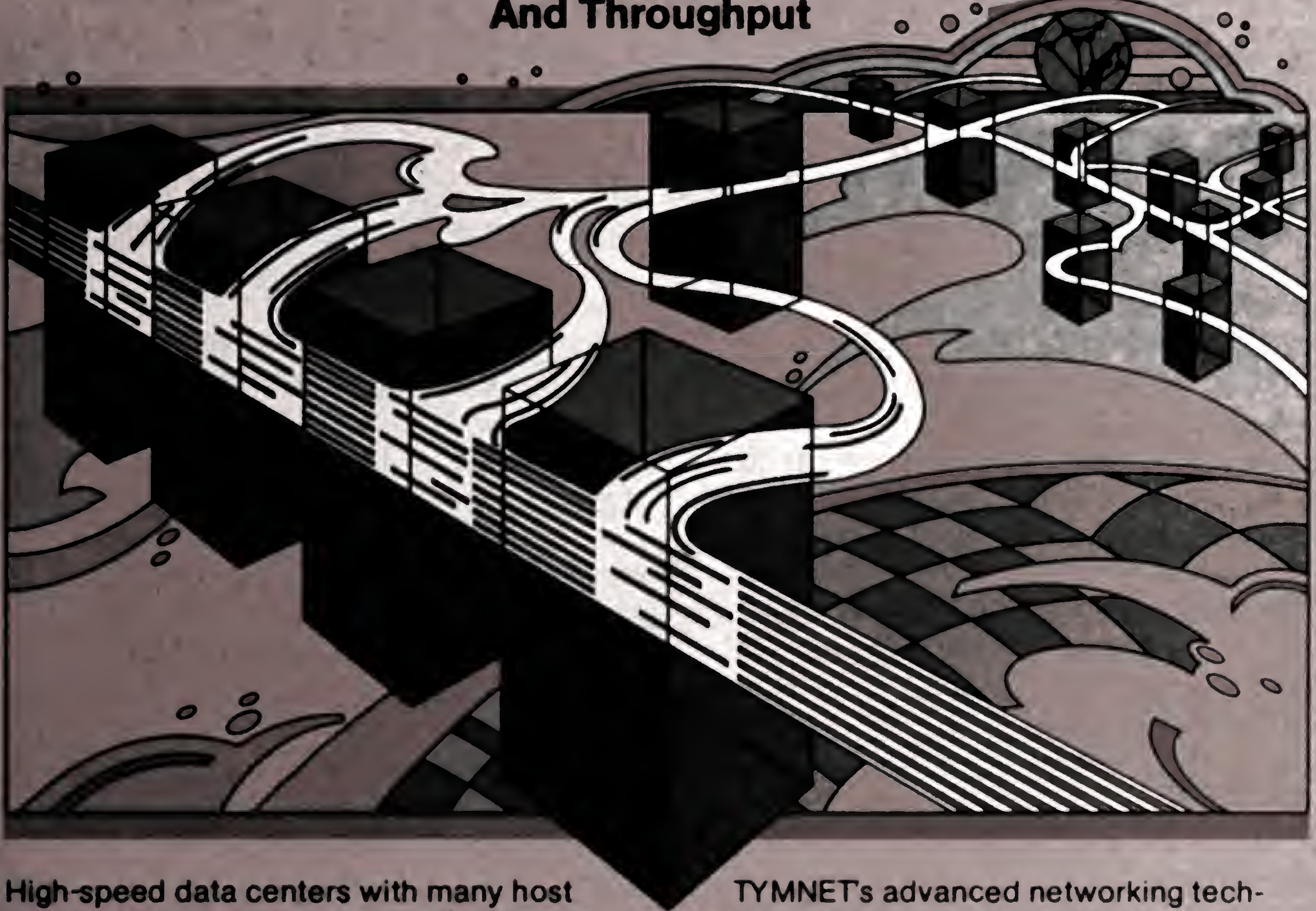

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Support loss forces replacement

COLUMBUS, Ohio — It was a nightmare that every computer user dreads: A vendor halts support of a critical system, and the application is sufficiently esoteric that an alternative is not readily at hand. Not a moment can be lost, and the ensuing scramble involves not a little bit of risk.

For the Chemical Abstracts Service (CAS), a division of the American Chemical Society based in this Midwest capital, the system involved consisted of Conographic 9 terminals from Hughes Aircraft Co., used in publishing the CAS 77-year-old weekly journal, *Chemical Abstracts*.

"The vendor had withdrawn support of the product, and we were having trouble finding replacement parts," said Hans Dreyer, system engineer at CAS.

Chemical Abstracts contains summaries of chemistry articles, professional papers, chemical patents and reports.

The abstracts act as research sources for chemists, engineers, scientists, students and professors and often are accompanied by drawings of complex chemical structures and chemical and mathematical equations.

CAS requires graphics terminals like the Conographic 9 system because complex chemical structures and equations must be displayed on a screen exactly as they will appear in print in *Chemical Abstracts*, Dreyer maintained.

"If a mathematical symbol is to be printed twice as large as another, the two symbols must appear in proportion on the display screen," he said.

The terminals are connected to two Digital Equipment Corp. PDP-11/24 series minicomputers that are connected to an IBM 370 mainframe that controls data entry and phototypesetting operations.

Vendor support withdrawn

Hughes withdrew from the terminal market support, and CAS found itself without vendor support. Dreyer's group was responsible for scurrying to find a replacement. "We evaluated terminals from a number of manufacturers," he said.

CAS chose four Vistagraphic 1000 display terminals from Calcomp, an Anaheim, Calif., firm. With this system, whenever an image was altered by the operator, the change was seen on the screen instantly.

CAS needed this capability in publishing *Chemical Abstracts*, because large amounts of information were constantly altered.

The new terminals provided other benefits as well. "The old terminals had to be reinitialized from time to time to clear the screens because storage tube technology sometimes leaves traces of previous images on the terminals," Dreyer explained. This procedure was not necessary with the new terminals.

Magazine reproduction was not the only use that CAS made of the abstracts. They are also available from an on-line data base, a cumulative index for *Chemical Abstracts* that CAS publishes every five years.

The index is so large that it has earned a place in *The Guinness Book of World Records*. The 1983 edition, for example, contained more than 130,000 pages and 25 million entries in 75 volumes.

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Distributed processing system remedies hospital's ills

CHICAGO — Despite an ailing DP budget, a major hospital here implemented an information center and distributed processing technology with the hopes of nursing its report delivery system back to health.

When the manual system for delivering user reports throughout the sprawling 28-building South Side campus of Michael Reese Hospital & Medical Center reached capacity, Bill McNichols, the hospital's technical services manager, realized something had to be done.

"It became clear that we could not support our growing user base with one or two report deliveries per day like we did with our batch processing customers," McNichols said. "Users were going to need documents, memos and graphs on demand."

With the data center more than a mile away from some of these buildings, McNichols continued, "you can guess how many users were willing to make the trip over here just to pick up a report."

The hospital uses low-cost dumb terminals as user workstations with its IBM 4341 Group II mainframe running VM/CMS. Printer requirements, however, threatened to limit the network's effectiveness.

"We wanted to produce software tools that would emulate micro tools," McNichols said. Even with terminals in several work areas there was little printer support.

"We were trying to foster the use of productivity tools for office automation within the department," McNichols said.

Managing resources difficult

The hospital used IBM's DCF and GML for text processing and SAS Institute, Inc.'s SAS/Graph for presentation graphics and reporting. According to McNichols, this range of products created a big demand for small, specialty printers. "Once we got three or four different printers and 15 to 20 people using them, managing those resources got to be very difficult."

The printers were simply defined to Remote Spooling Communications Subsystems (RSCS), the spooling subcomponent of VM.

RSCS was a headache for the DP staff, McNichols said, because central systems operators had to leave the command room to go reset the printers numerous times per day.

The hospital wanted to be able to share work loads between printers and send reports to a list of printers. "RSCS could not help us accomplish these goals," he said

Michael Reese Hospital now uses the ACX-PM Printer Manager from Autovative Computer Extensions, Inc. in Downers Grove, Ill., to support a network of printers. Included are Ascii printers connected to asynchronous communications lines.

Among the early users of the ACX-PM network were the Medical Center's clinical departments. Ascii terminals and printers were already in use, and the users were anxious to access the central computer for word processing or for developing departmental systems, McNichols said. ACX-PM allows users to connect to the host and control printer output.

A recently developed system that supports the Development Office allows users to print various types of forms, including letterhead stationery and envelopes on a Diablo Systems, Inc. 630 printer.

ACX-PM is built into the system and appears transparent to the user. Now, printers can be shared between different applications.

There are plans to continue the spread of low-cost printer devices within the institution.

"We're looking at the possibility of adding some new function to our Payroll/Personnel system by making the screen-image printers more versatile," McNichols said. "It will surely help get information to the user more quickly."

HOW TO
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Stiff competition presses winery into use of graphics

System aids planning effort

SAN FRANCISCO — When prohibition confronted one Northern California wine company with the sour grapes of public opinion, the company made grape juice. Today, that winery is adapting again to outside influences, this time with computer graphics.

Italian Swiss Colony Wines of California, Inc., the country's fourth-largest wine maker, has been producing wine since the mid-1800s. The company reports annual sales of seven million cases of wine in the U.S. and 10 foreign countries, from its product line of dry table wines, dessert and fortified wines, sparkling wines, brandy and vermouth.

During the past three years, the firm and its products have faced an unusually competitive business climate. Foreign wines, which cost less to produce than domestic ones and sell for less despite import tarriffs, are hurting U.S. producers' sales, according to Bill Hardwick, a business analyst for Italian Swiss Colony. In addition, he said, the wine industry has been relatively stagnant for the past two years, so domestic companies are battling each other to increase their market shares.

Italian Swiss Colony has responded to business pressures with tight control and planning measures, some of which rely on effective use of computer graphics. The firm employs an IBM Personal Computer, Lotus Development Corp.'s 1-2-3 software and Hewlett-Packard Co.'s HP 7470 two-pen graphics plotter to produce charts and graphs that managers use to help them with business decisions.

Daily order report

Hardwick said the graphics application on which the firm's managers rely most heavily is a daily order report that he produces for them. Graphs included with the report show how many cases Italian Swiss Colony's distributors ordered the previous day and compare these numbers with the company's sales forecasts.

"These updates are necessary for quick assessments of our position and [for] decisions made between . . . business meetings," Hardwick said. He produces the reports by entering order statistics into the Personal Computer, filling in a Lotus worksheet, converting the information to a chart format, reviewing the chart on his screen and outputting the graphics to the plotter.

Hardwick's finished reports have numerical data on one side and charts on the other. Many managers prefer the graphics side, he said, because it gives them information at a glance.

Because they are easy to understand, the charts help Italian Swiss Colony's managers make accurate business decisions. "The bar and line graphs generated by the plotter are much less confusing than columns of numbers," Hardwick explained. "The graphs decrease the possibility of misunderstanding information and, in doing so, prevent potential mistakes in decisions."

The wine maker also uses graphics in its monthly business meetings. Hardwick produces graphs that show year-to-date business figures, forecasts for the future and different brands' recent sales against previous years' sales. He has each graph made into a transparency that he uses to explain business results.

Before Italian Swiss Colony purchased its graphics plotter in October 1983, presentations at business meetings consisted of hard-copy output of raw data. "The method wasn't satisfactory," Hardwick said. "Trying to explain the numbers as they stood alone was too confusing."

The graphics presentations help managers get through business meetings and on to the business of producing wine, he said.

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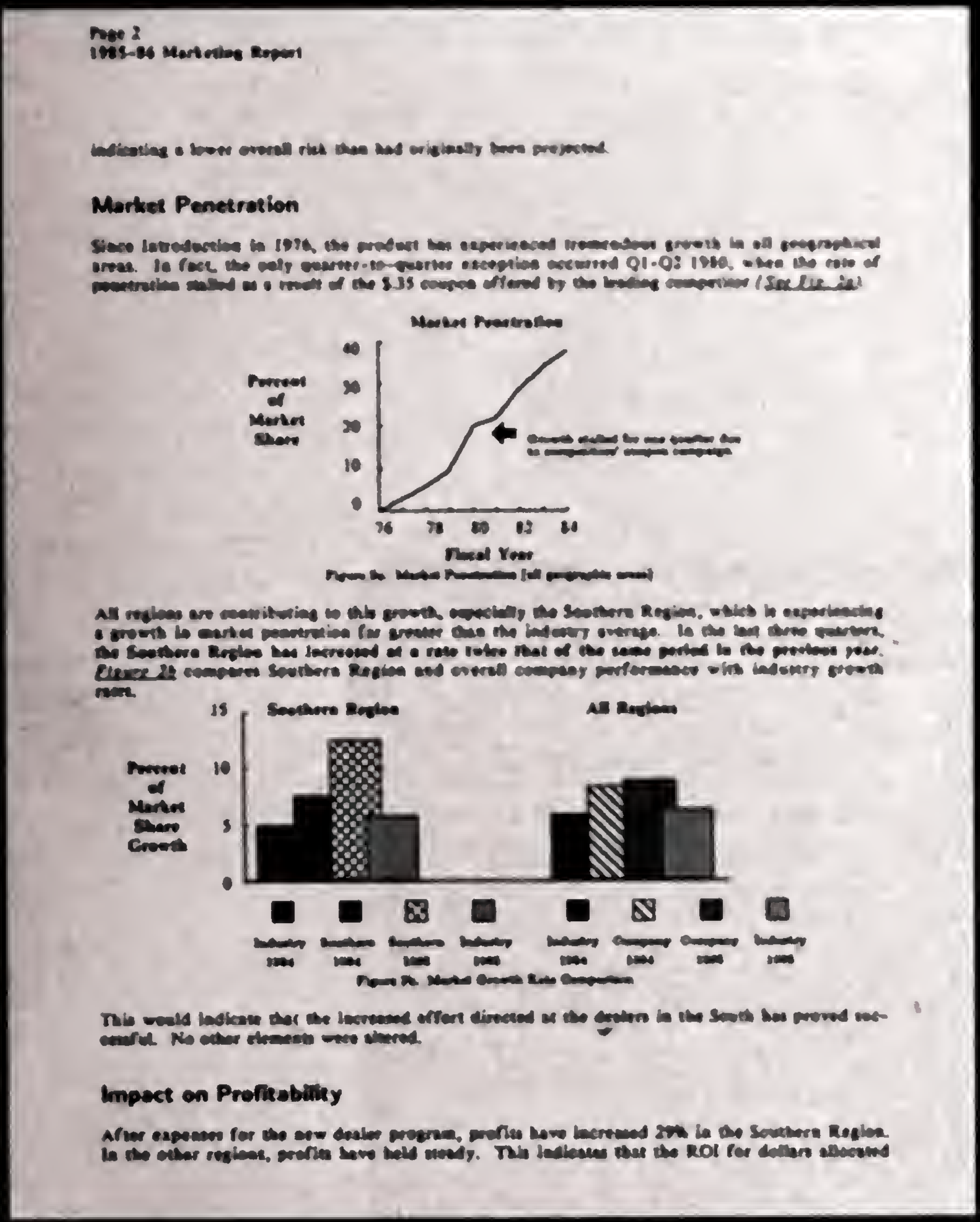
Market Penetration
Percent of Market Share
40
30
20
10
0
Growth stalled for one quarter due to competitors' coupon campaign.
76
78
80
82
84
Fiscal Year
15
Southern Region
All Regions
Percent of Market Share Growth
10
5
0
Industry 1984
Southern 1984
Southern 1985
Industry 1985
Industry 1984
Company 1984
Company 1985
Industry 1985

Page 2
1985-86 Marketing Report

indicating a lower overall risk than had originally been projected.

Market Penetration

Since introduction in 1976, the product has experienced tremendous growth in all geographical areas. In fact, the only quarter-to-quarter exception occurred Q1-Q2 1980, when the rate of penetration stalled as a result of the $.35 coupon offered by the leading competitor (See Fig. 2a).

Figure 2a. Market Penetration (all geographic areas)

All regions are contributing to this growth, especially the Southern Region, which is experiencing a growth in market penetration far greater than the industry average. In the last three quarters, the Southern Region has increased at a rate twice that of the same period in the previous year. Figure 2b compares Southern Region and overall company performance with industry growth rates.

Figure 2b. Market Growth Rate Comparison

This would indicate that the increased effort directed at the dealers in the South has proved successful. No other elements were altered.

Impact on Profitability

After expenses for the new dealer program, profits have increased 29% in the Southern Region. In the other regions, profits have held steady. This indicates that the ROI for dollars allocated

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TANDEMCOMPUTERS

Disk drive eases computer game firm's system overload

PASADENA, Calif. — A computer game company here recently found itself in the unenviable position of having to turn away prospective business because its computer system could not handle the in-house load. The dilemma was resolved through the firm's adding a new disk drive and upgrading an old system, moves that also helped to increase productivity and cut costs.

Cheshire Engineering Corp., a small electronic engineering and computer science firm, found itself in a predicament last year when its Digital Equipment Corp. PDP-11/23 could no longer handle the company's development load, according to Larry Zwick, software design engineer and system manager.

The seven California Institute of Technology graduates who had launched the company in 1982 had chosen the PDP-11/23 because it was uniquely suited to a fledgling company's budget, Zwick said.

The computer's disk drive system combined an 8-in., 20M-byte Winchester with an access time of 60 to 70 msec and a floppy backup — a system that was inexpensive and reliable but offered neither high speed nor high performance.

Cheshire had three games on the market within a year and a half after its start-up, with two more under development. Also in the works were real-time control software products such as Vasi, a videotape recorder animation controller, and several other special applications systems including one to transmit a continuous loop program for a CATV network, according to Zwick.

Losing potential business

With 10 employees now up on its in-house system, the company found it was losing potential business because of system overload, Zwick said. In order to find the system's weak links, the staff performed a series of tests on the system that pinpointed the disk drive.

After surveying the marketplace, Cheshire settled on a 128M-byte Atlas disk drive with an access time of 18 msec, manufactured by Alpha Data, Inc., of Chatsworth, Calif., together with an Emulex Corp. converter.

At the same time, Cheshire added a Cipher Data Products, Inc. F880 streaming tape that operates at 100 in./sec. in 1,600 bit/in. mode and 50 in./sec. in 3,200 bit/in. mode and an Emulex controller.

Cheshire upgraded its PDP-11 by removing the 11/23 processor and adding an 11/73 .25M-byte processor board. A cabinet and power controller were also purchased, according to Zwick.

Overall time savings

"We estimate between 10% and 20% overall time saving per day per employee," said Will McCown, Cheshire vice-president and principal hardware engineer.

"This enables us to bid lower on new business proposals, charge clients less than our competitors and still increase our own profit margin."

Productivity is also up at Cheshire. "Before we acquired the new drive, the system would completely clog up during any payroll or financial work. What we call our real work — programming — as well as editing and word processing, would come to a halt," Zwick said.

More complete use

The staff at Cheshire is making more complete use of the computer's capacity now, Zwick said. Before upgrading, the staff went out of its way to avoid having to use the main system. They ignored mistakes or tried to remember where they were. Sometimes they resorted to writing down a catalog so they could feed in all the mistakes at once, he said.

Cheshire decided to run some tests to measure the improvement with the upgraded system, Zwick said. Using a time board, the staff measured when the computer was actually waiting for the disk, he added.

With the old system, it took 70 msec per average transfer. With the present system, it takes between 14 and 20 msec per transfer for a small number of blocks and 20 msec for a large number of blocks, according to Zwick.

Measuring daily backup time

Another test measured the time required to do the daily backup performed to save each day's work, Zwick said. This required more movement of the disk than most operations and involved bigger pieces of data. It took the same amount of time to back up the old disk as it did to back up the new one, but the new one was five times larger than the old one, according to Zwick.

He said the old disk was so slow that it could not keep the streaming tape in streaming mode, causing the backup to take a long time given the amount of data on the old disk.

"We may need more memory and a faster processor. But we will be able to keep the same disk drive, since we plan that it will serve up to 20 people easily," Zwick said.

Cheshire's system should serve for some time to come, according to Zwick. The PDP-11/73's .25M-byte main memory is now upgradable to 4M bytes of memory if they need it some time in the future, he said.

Guess who just unveiled seven

The new IBM 3161 ASCII Display Station is really seven different ASCII displays in one.

In addition to its own function-rich native mode, the new IBM 3161 can emulate:
- IBM 3101 Model 881
- ADDS Viewpoint*
- Hazeltine 1500*
- Lear Siegler ADM-3A*
- Lear Siegler ADM-5*
- TeleVideo 910*

Besides fitting nicely into existing systems, the IBM 3161 also offers impressive improvements in ergonomics.

Improved Ergonomics For Improved Productivity

Take the 102-key ASCII-style keyboard, for example. Its low profile, gentle contour and typewriter touch make for faster keying with fewer errors. The keyboard has programmable function and editing keys so it can be custom-tailored to meet your application needs.

Then, for comfortable viewing, there's the tilt and swivel of the 12" display. And the sharp, clear 8 x 16 character matrix for easy reading. Plus cursor, character and field attributes (blink, reverse video, underscore, dual intensity, etc.). And scrolling. And partitioning. And lots more.

The IBM 3163 with Plug-in Cartridge

And, as if that weren't enough, we're also announcing

The sharp 8 x 16 character matrix helps make for easier reading and fewer operator errors.

a second new ASCII display station with even higher function—the IBM 3163.

Outwardly, these two new displays look alike. But the 3163, in addition to its built-in emulation of the IBM 3101 Model 881, also offers the ability to emulate the DEC VT 52 and VT 100* by means of a unique plug-in cartridge.

And while you'll like the power and flexibility of the 3161, for your high-function applications the 3163 goes even further. For example, a 7,680-character buffer and up to three windows enable you to view and modify portions of different host data bases. The 3163 lets you redefine and even recap the keys.

On both displays the setup is menu-guided and written in plain English, so it can be done easily and quickly. The point is, both are designed to improve your user productivity.

Very Attractive Prices

The price per terminal is $695 for the 3161 and $1,095 for the 3163. Quantity discounts are available. What's more, IBM maintenance offerings start as low as $35 per year per terminal for customer carry-in repair.

Now there's a new family of ASCII displays with the quality, service and support IBM is famous for. Both displays are available through IBM Authorized Distributors and IBM marketing representatives.

FEATURES	3161	3163
Lines x Characters	25 x 80	25 x 80
Double-sized chars	No	Yes
Line drawing chars	24	24
Vertical scroll	Jump	Jump/ Smooth
Definable function keys	24	24
Windowing	No	Yes
Partitioning	Horiz	Vert/Horiz

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IBM

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DBMS critical to firm's massive data analysis task

WINDSOR, Conn. — A firm here that helps nuclear utilities design and maintain portions of their reactors is using a relational data base management system to reduce engineers' work loads and expand report-writing capabilities.

The firm, Combustion Engineering, Inc., designs replacement cores for nuclear reactors, a task that calls on engineers to plug one piece of numerical data, or derivations of that data, into a number of different formulas. The firm also inspects its customers' steam generators for potential flaws, a job producing large data sets that require detailed engineering analyses.

Until last spring, when the firm brought up its DBMS, both of these processes suffered from inherent inefficiencies; among them were the following:

Replacement core design — data redundancy. A nuclear reactor exhausts a portion of its fuel supply every 12 to 24 months, and this must be carefully replenished. In this process, the added fuel and the fuel that remains inside the reactor must be arranged so that they produce even heat generation.

Combustion Engineering manufactures mechanical assemblies that hold about 200 of the long, thin rods in which nuclear fuel is stored. The firm also conducts sophisticated design work to determine how these fuel assemblies — a typical reactor holds 217 of them — should be positioned within the core.

Nuclear engineers at the firm study fuel depletion rates, energy production, reactor safety and other parameters to derive optimal configurations.

Before Combustion Engineering brought up the relational DBMS, engineers had to manipulate their design data to fit the various schemes, according to Steve Wagner, supervisor of physics design systems.

"The physics and engineering programs we use have been developed by different people and even different organizations, and they have used a variety of input formats," Wagner said. "Up to now, the design engineers have had to work with all of these; they've used a hand calculator or picked off the fundamental design data from a drawing and formatted it themselves for input into the programs."

One of the problems of the approach, he said, was that engineers had to manipulate the same piece of numerical data over and over for use in the different programs.

Generator inspection — inflexible reporting. As part of its maintenance services to clients, Combustion Engineering inspects tubes that carry steam through its customers' steam generators. The generators are one of a nuclear reactor's safeguards against radioactivity leaks, and the inspectors look for incipient flaws that might lead to a problem.

The Combustion Engineering inspectors send a probe that detects flaws into the thousands of tubes that each generator contains. With frequent inspections — some tubes must be inspected each time a reactor is refueled — the firm generates a large amount of data.

Data tracking crucial

The ability to keep track of this data is crucial, according to Wagner. "The key to our field-service business is our ability to manage the data we collect," he said.

Combustion Engineering had used standard Fortran programs to prepare client reports on a Control Data Corp. Cyber 180/855 with two million 60-bit words of memory. "These were inflexible" Wagner said, "and it was expensive to change the programs to suit each utility we serve."

Last spring, the firm brought Logica, Inc.'s Rapport relational DBMS up on the Cyber. Engineers and managers access data they need through Digital Equipment Corp. VT100 and CDC Viking 721 terminals and through IBM and Hewlett-Packard Co. microcomputers in terminal-emulation mode.

For design tasks, engineers use the DBMS to prepare and store data for the different fuel assembly arrangements they are considering. With a full screen input capability that Combustion Engineering designed, the engineers can call up a schematic diagram of the inside of a reactor and type in indicators of where they want to place assemblies.

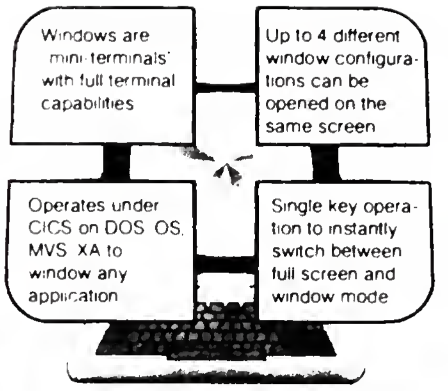
The DBMS takes this and other design data and inputs it to the various engineering programs. The engineering programs, sequences of calculations, then simulate actual reactor operations and gauge the efficiency of proposed fuel assembly arrangements. The firm also uses its DBMS to organize and report on data that it gathers during probes of steam generator tubes. A Zetec Corp. DDA-4 signal processing system on a 1M-byte HP 9000 micro converts analog signals from the probes into digital information.

The investigators then pass the information on to the Cyber, and engineers working with the mainframe perform further analysis.

Managers can also call for ad hoc reports if they spot a new phenomenon and want to examine it. Wagner said they might, for example, ask for a report that lists each steam tube that has had a certain type of flaw.

different ASCII displays in one.

The IBM 3161 ASCII Display Station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NEWS

Bank's package rates commercial loan prospects

CHICAGO — Joseph d'Ouville, senior vice-president at Exchange National Bank of Chicago, has been searching for a commercial loan package for more than 10 years.

"Most of the packages I looked at required too much paperwork, were too regimented or were too difficult to use," d'Ouville said.

Until a year ago, his search focused on mainframe packages. Then he came upon Customer Relationship Information System Program (Crisp) developed by Micro Resources, Inc. (MRI) of Novato, Calif. The package runs on an IBM Personal Computer XT with IBM's PC-DOS operating system and 320K bytes of random-access memory.

"Crisp was the only functional microcomputer package available when we were looking at microcomputer commercial loan packages," d'Ouville noted. The senior vice-president said that approximately 50 officers from the bank's eight divisions currently use Crisp. The software runs on a Novell, Inc. local-area network of six IBM Personal Computers.

Through a complete business cycle

Crisp is an integrated, multifunction reporting system that takes commercial loan officers through a complete business cycle: selecting customers and markets, setting goals, implementing plans, soliciting business, pricing loan packages, managing the business and measuring results. The package is designed to measure the profitability of commercial customers and to determine pricing for new lines of credit. It supplies three functions: planning, information retrieval and reporting.

A commercial customer's business is typically spread throughout a bank — deposits are made in branches, loans are certified at the main office and services are supplied by operations. With most software packages, determining a customer's profitability can be difficult, the senior vice-president said.

Crisp helps to integrate customer data bases into one package that enables officers to measure immediately the profitability of business alternatives, price loan packages and report the information to management and customers. Since Crisp places the information at the officers' fingertips, it enables them to make better decisions faster and communicate the results in tailored, easy-to-use report formats, according to d'Ouville.

"We were looking for a way to show each bank division how to break down profitability by its officers," d'Ouville said.

In addition, Crisp provides officers with a profit planning tool to develop goals for a portfolio of customers. The system includes a business solicitation module to help officers manage time, keep records straight and organize their calendars. A sophisticated loan pricing module allows officers to respond almost immediately to customer questions about costs while an account management module monitors customer performance once the loans have been booked. Finally, Crisp evaluates officers' performance against preset goals.

Exchange Bank uses the package in conjunction with data stored on its IBM 370 and 4341 mainframes. "Crisp automatically extracts data from various bank applications on a monthly cycle and stores customer information files on the local-area network's 40M-byte hard disk," d'Ouville noted.

"We can respond to loan requests in a much more meaningful fashion by analyzing the situation with the pricing module and evaluating the alternatives we have," d'Ouville pointed out.

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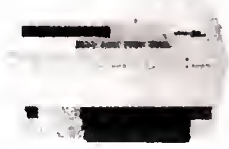

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"Will it reverse image or boldface fonts?

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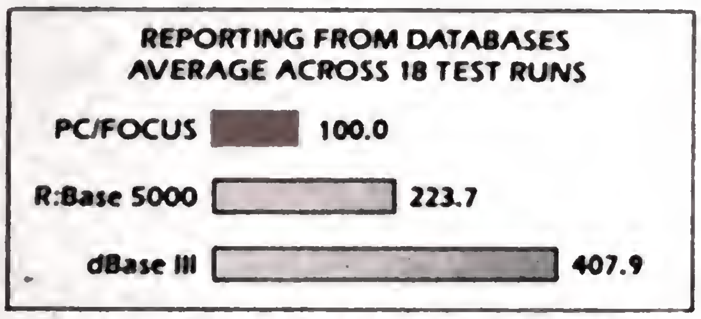
Database Reporting:

Report requests of various levels of complexity were run against single and multiple databases. Eighteen separate test runs were conducted, with PC/FOCUS averaging 45.2% faster than dBase III™ and 40.0% faster than R:Base™ 5000.



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Automated bookkeeping system aids customer services

Firm's on-line system tailors client reports

NEW YORK — A 17-year-old direct-mail list management firm recently purchased a new computer system to automate its bookkeeping functions — only to discover that its new system was useful in helping to supply critical customer services as well.

Demographic Systems, Inc. (DSI), based here, manages and maintains mailing lists for clients in such retail fields as packaged goods, according to Mark Yearick, the firm's advertising and promotion manager. In addition, the firm provides client companies with computer services from duplication elimination to list enhancement and age coding, Yearick said.

DSI previously used a time-shared IBM 3081 mainframe for such jobs as processing name and address records. However, these large systems proved unsuitable for smaller functions, such as bookkeeping and related reports, according to DSI President Stanley Monsky.

Moreover, Monsky said, record keeping also had to accommodate both DSI's internal reporting needs and the requirements of its clients, who usually wanted reports to match their own accounting systems. Since a mailing list is among a company's most valued assets, list owners insist on being supplied with details regarding sales, payments and receivables information.

"We need to have all this information in an interactive data base so that we have access to it when necessary," Monsky said. Because his clients' needs are quite varied and often difficult to predict, flexibility in entering and retrieving data is essential, he said. "We also wanted a machine we could quickly integrate into our operation."

To meet its growing needs, DSI bought a Wang Laboratories, Inc. VS 80 with 512K bytes of main memory that was installed in January 1983, according to marketing manager Yearick. The system included a 90M-byte disk drive, 10 CRT display terminals, a DWO55S 600 line/min printer and a B600-22 letter-quality printer, all from Wang.

Bookkeeping software consists of accounts payable, accounts receivable and general ledger systems written in Cobol and supplied by Mini-Computer Business Applications, Inc. of Montrose, Calif., reported Allen Williams, DSI's DP manager.

Although the VS was purchased for bookkeeping applications, DSI management soon realized other possible uses for the system, such as compiling count reports.

"Our business," Monsky commented, "is renting lists and defining markets. If a packaged goods [client] wants to mail 30 million samples to specific groups of people, he needs to break down the country into certain geographic and demographic segments."

Count reports help clients plan such campaigns, Monsky said.

To streamline production of the reports, DSI moved its integrated data bases, which contain all available information by county, Zip code and census tract, to the Wang VS. The data can also be merged with information on the national population and with DSI's in-house data bases to help a user focus on a specific target market, according to Monsky.

DP manager Williams developed a report generator in Cobol for the system. Now, when an account asks for specific information, Williams said, he can generate new reports on the VS in a matter of hours. Information can be retrieved and displayed in virtually any format.

In one instance, Monsky related, a DSI client required a report on newspaper circulation. DSI added circulation data to its existing data base and delivered the report the next morning, he continued.

Household data base

In addition to analyses along county or Zip code lines, DSI has also developed reports based on household-level data, Monsky said. "We believe the best possible geographic definer is the household," he noted.

DSI's data on some 65 million households is the starting point for reports that allow clients to use age as a fundamental selection factor, he said. The company's time-shared mainframe first compares a data base of about 167 million names with a client's file, he said. For every matching record, it then attaches information on family members, including exact birth dates, to the client's file. Counts from this expanded file are transferred to the VS, available for use as dictated by a client's specific needs, he said.

The age report derived from these counts shows how the client's list compares to DSI's file and to the national population in terms of age distribution, Monsky said. An index number for each age bracket tells the client in which bracket his list is likely to achieve the best response, he added. Reports are compiled on a national, state or county basis.

More than half of DSI's staff already has hands-on use of the VS, and new employees quickly take to the system, Yearick said.

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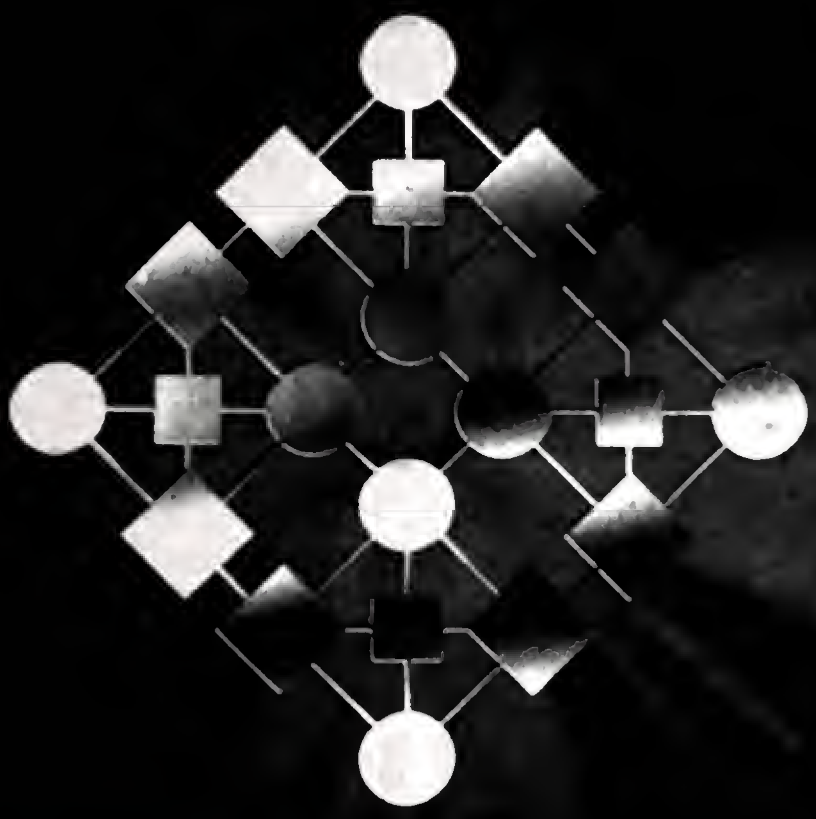

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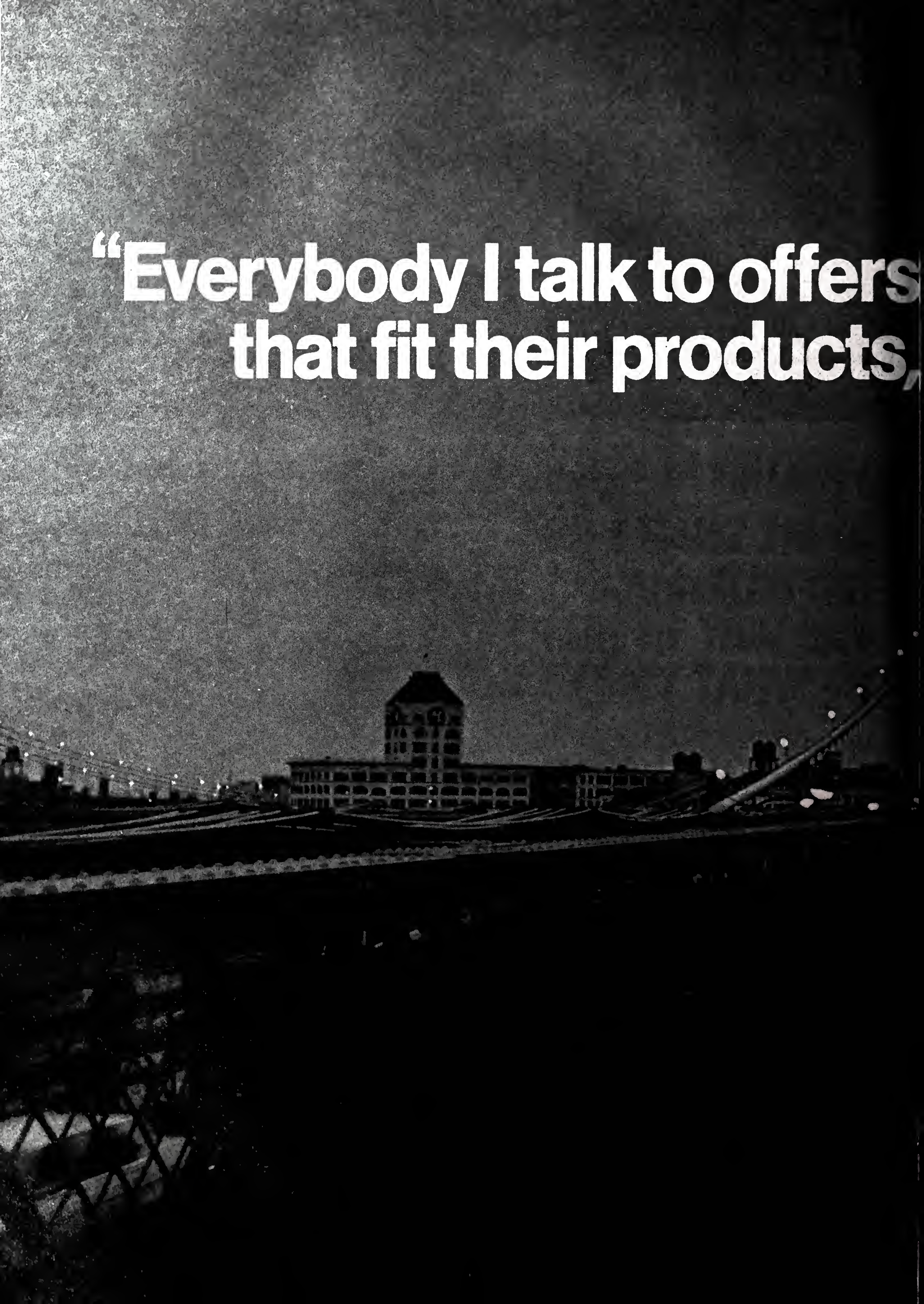
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that fit their products,

solutions
instead of my needs."
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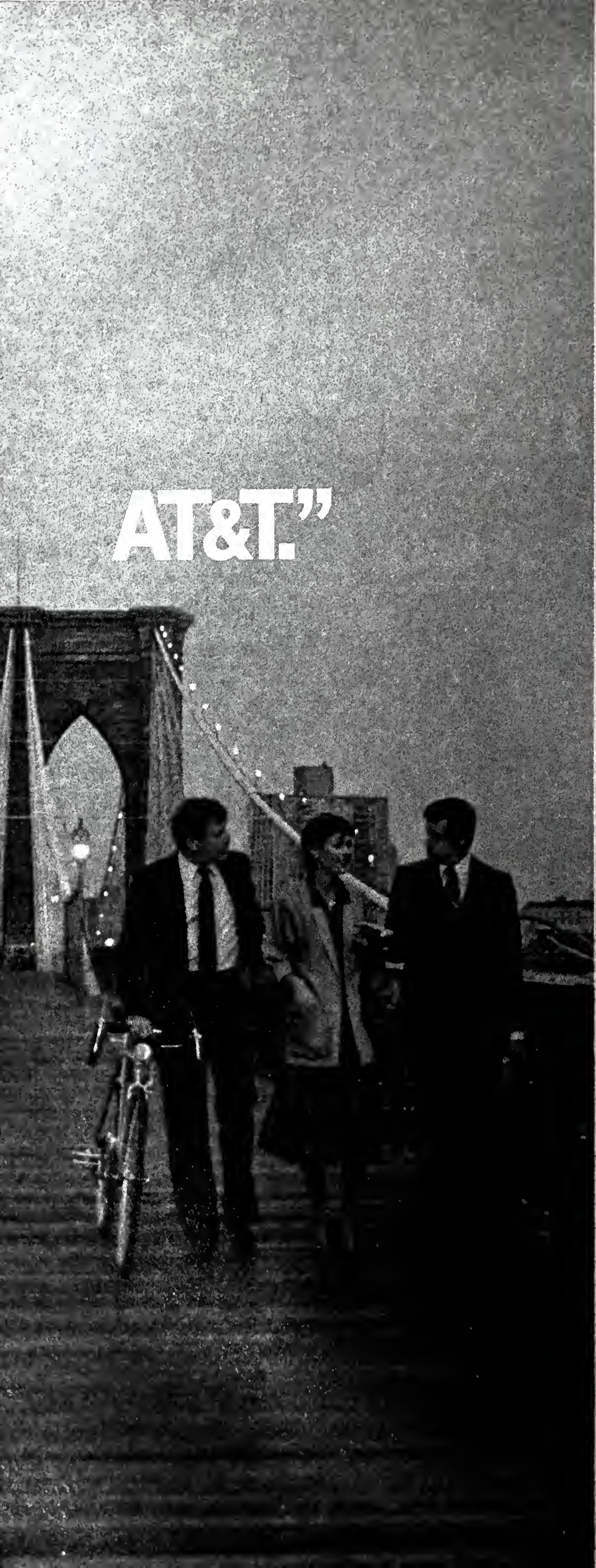

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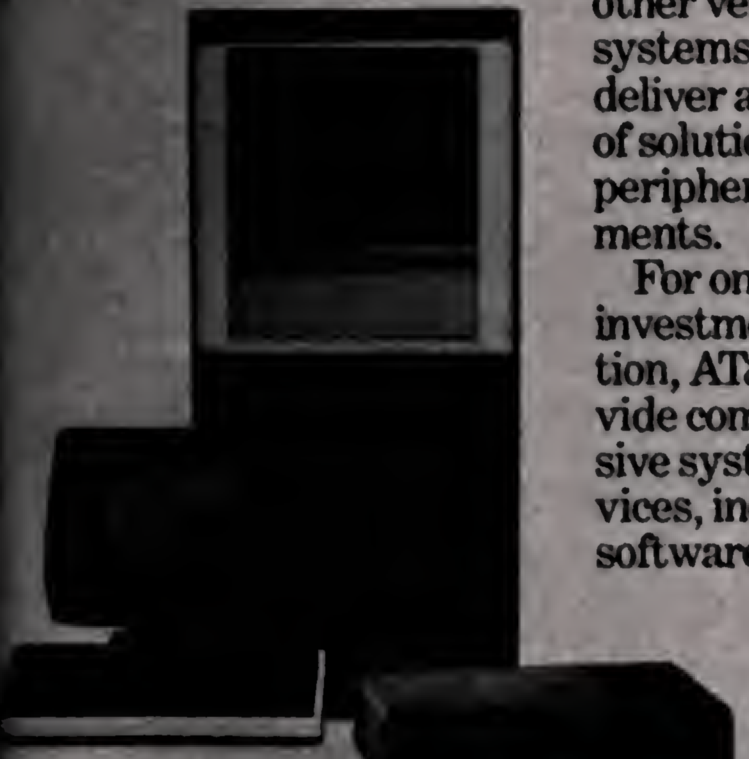

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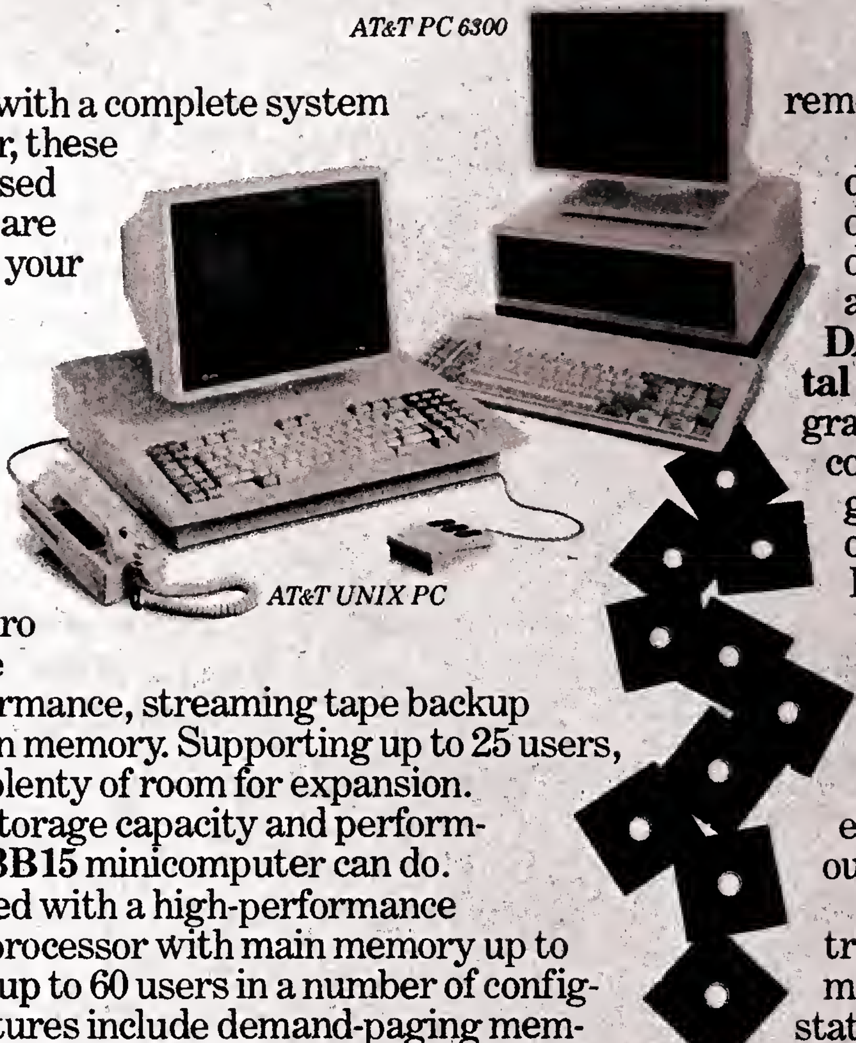

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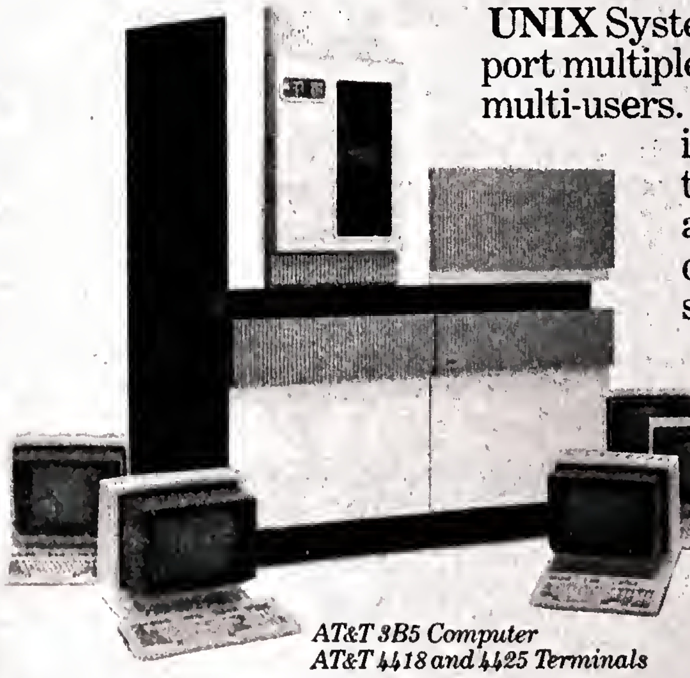

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Net fans air-conditioning supplier's delivery effort

FORT WORTH, Texas — A manufacturer here that once considered a three-day turnaround on deliveries an exemplary feat now consistently gets goods to customers two days after receiving an order — and often turns an order around in one day.

The time-saving was the result of a new on-line, satellite-based communications network, according to J. D. Ratliff, DP manager for Atco Rubber Co., a supplier of industrial air-conditioning duct products to some 4,000 customers.

According to Ratliff, delivery time is critical to the firm's success. "In our business," he said, "the prompt delivery of a customer's order is as important as price and product quality."

Before Atco Rubber brought in the satellite-based network, the firm had relied on dial-up Wats lines to transfer shipping and inventory data between terminals in its eight manufacturing plants and the corporate mainframe, a 196K-byte Honeywell, Inc. Level 62. An operator at Fort Worth corporate headquarters called each plant once a day to gather order and delivery information that would update the mainframe's central data bases.

The dial-up batch operation allowed only one plant to transmit data at any one time, and plant managers could only send data once each day. "Batch processing allows you to get your data from point A to point B," Ratliff said, "but it's very slow."

On-line communications capability

In the spring of 1983, Atco Rubber started looking for a system that would provide on-line communications capability. In January 1984 the firm acquired a 1M-byte Burroughs Corp. 1955 mainframe with Poll/Select protocol and linked the machine to terminals at the plants over RCA Cyclix Communications Network, Inc.'s satellite-based net.

Since then, Atco Rubber has opened four new plants. Each of its 12 locations now has an ET1100 terminal and an AP300 printer, both from Burroughs, with which to access the host computer.

Plant managers use the network to retrieve information about bills of lading, product inventory levels, production schedules and shipping transactions. Because all of Atco Rubber's data resides on the host, the satellite network plays a role in almost every phase of the company's operations.

When a customer calls in an order to the Fort Worth manufacturing facility, a clerk enters order data into an ET1100 terminal connected to the host. A proprietary software package automatically prices the order and creates a bill of lading, which is automatically transmitted over the network to the appropriate manufacturing plant.

At the plant, a manager receives the bill of lading on an AP300 and begins filling the order, either by using inventory or by initiating a manufacturing cycle to produce the necessary products. After each order is filled, the managers transmit a completed bill of lading back to the host, which produces an invoice for distribution to the customer.

Most customers receive their shipments and invoices within two days after they place their orders, and Ratliff said the turnaround helps cash flow. "The faster we can get the invoice into their hands," he explained, "the faster we'll be paid."

The on-line network also allows plant managers to update corporate data bases and make inquiries at all times, rather than once a day, and Ratliff said the capability has allowed Atco Rubber to improve its delivery and inventory trackings.

"With a dial-up Wats line, we were always behind in updating our shipments and inventory levels," he said. "With the on-line network, we can send shipments at any time during the day or night and have an instant record of what has been shipped and where," Ratliff added.

In turn, the improved tracking systems help the firm schedule its manufacturing capacity more efficiently, according to Ratliff. "The bottom line is that having fast and easy access to important operational data makes use more efficient and profitable," he said.

The satellite network itself is cost-efficent compared with the other option Atco Rubber considered for on-line communications. Ratliff said that when the firm was looking to install a network, it considered both AT&T and RCA Cyclix as vendors. Its managers figured that, in order to link the original eight plants, they would have to spend about $9,000/mo for AT&T line charges, compared with $4,000/mo for RCA Cyclix.

Included in the RCA Cyclix estimate were charges for network management services, a function Atco Rubber would have had to provide on its own under AT&T. "That's where the payoff was for me — not having to commit lots of money up front to start the network and then keep it running smoothly," Ratliff said.

Each of Atco Rubber's 12 plants currently transmits about two million char./mo over the network. Some plants have tied in Burroughs ET2000 personal computers, which employees use for word processing, spreadsheet analysis and terminal emulation.

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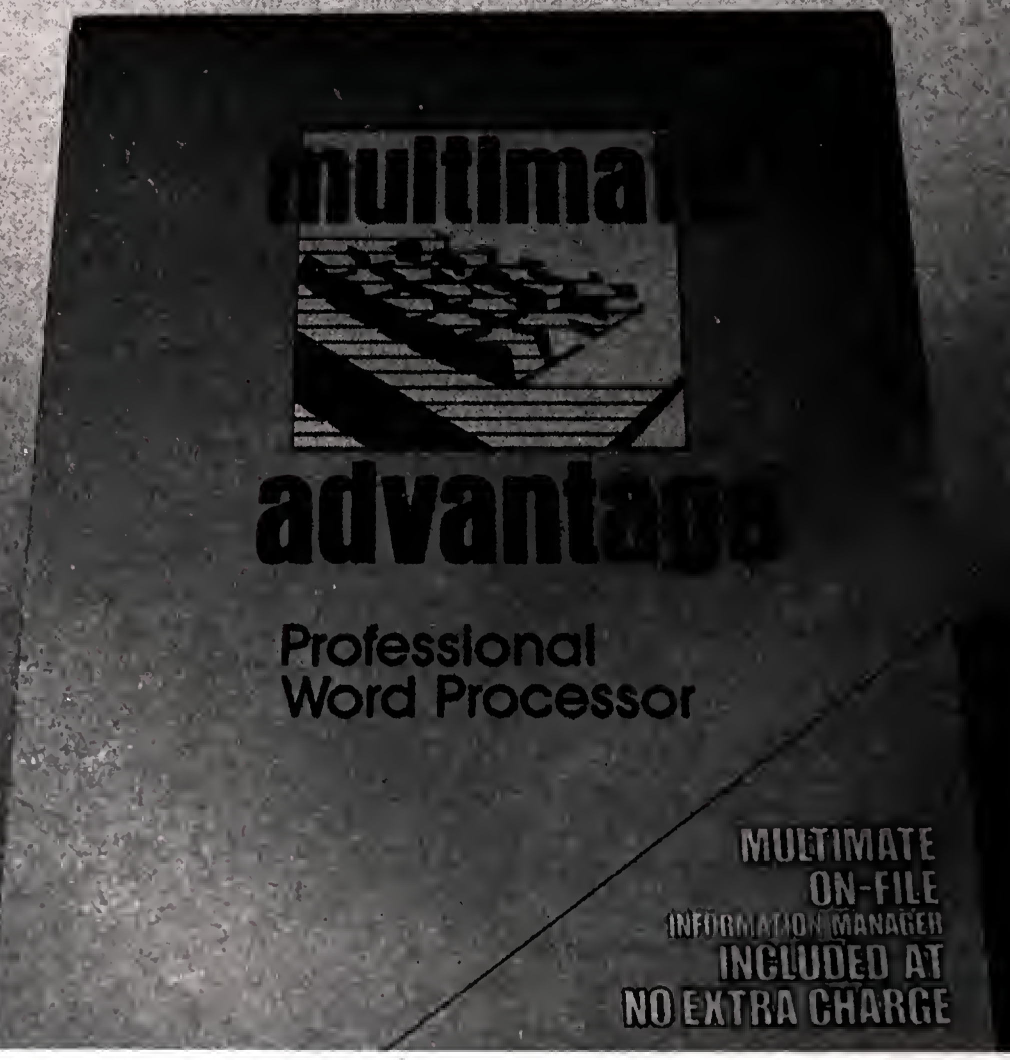

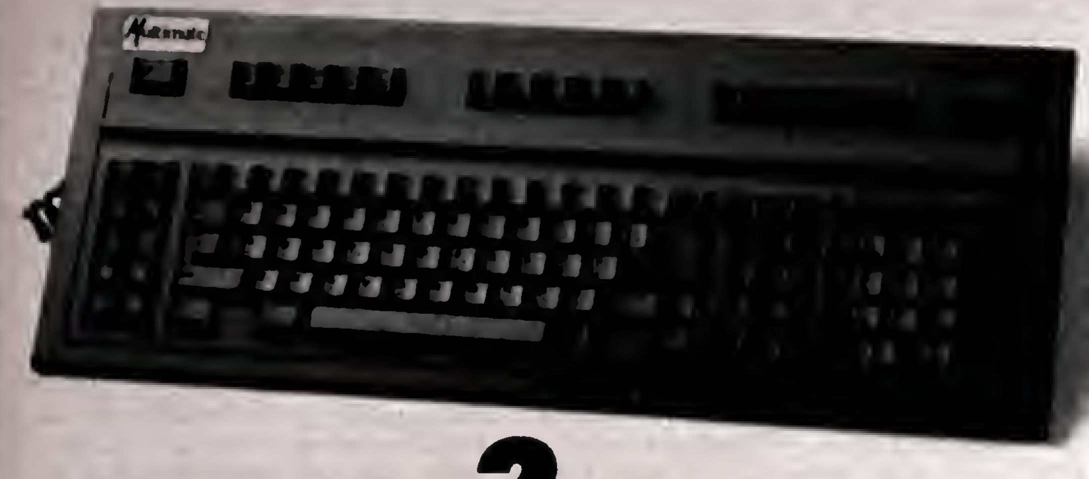

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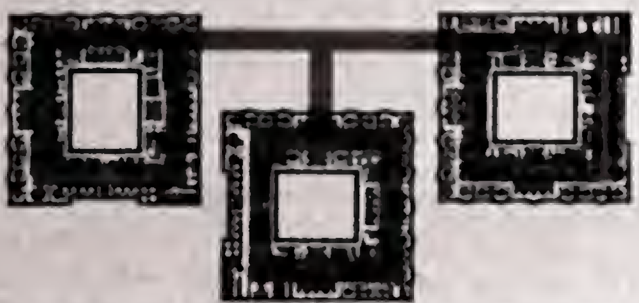

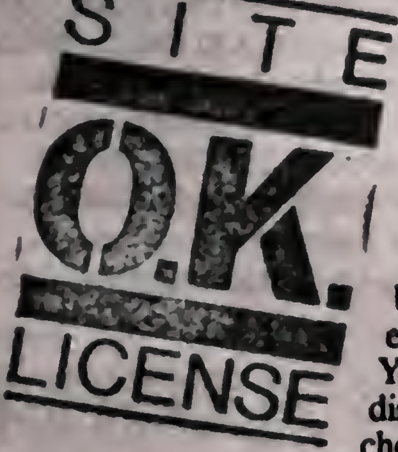

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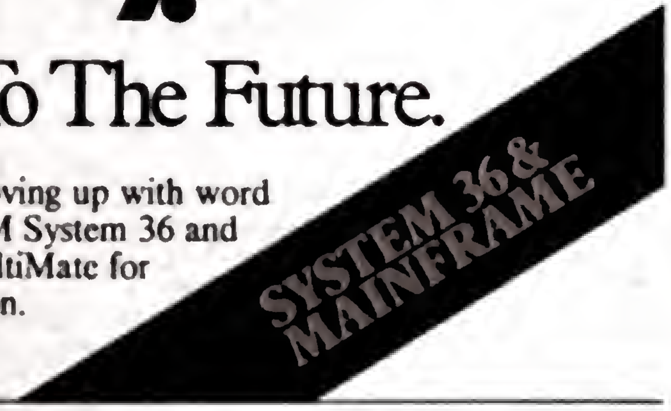

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Automation helps manufacturer track production

Micros and bar codes offer added flexibility

CHICAGO — One of the most fundamental automated operations in any factory is the shop floor data collection system used to record workers' production activities, such as arrival at work or completion of a shop order operation. At ITT McDonnell & Miller, a manufacturer here, microcomputers and bar code wand readers perform this vital task.

McDonnell & Miller, a unit within ITT's Fluid Handling Division that produces boiler safety controls and other fluid-handling products, installed the micros and wand readers in January 1984. According to David Jung, senior member of the technical staff at ITT's Advanced Technology Center, McDonnell & Miller brought in the configuration to give its managers a flexible system for data collection.

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> *Regardless of hardware, the feature that makes the system operable is the DCSI software.*

The technology center staff, based in Shelton, Conn., performs research and development for ITT's 290 divisions and corporations worldwide. Jung and his coworkers helped McDonnell & Miller design and implement its bar code data collection configuration.

McDonnell & Miller's previous system was a manual effort that had production workers fill out time cards and punch them through mechanical time clocks. The cards were collected at the end of each day and checked for errors. Afterward, clerks keypunched the time data and loaded it into McDonnell & Miller's mainframe, a 3M-byte IBM 4331, for payroll processing.

To replace the error-prone mechanical time clocks and make the data collection process more timely and efficient, Jung said, the organization investigated automated systems.

Microcomputers appealed to McDonnell & Miller's management because data collection systems based on micros were less costly and required less maintenance than mini-based systems, he said. Also, the organization's size made it a strong candidate for a micro-based setup.

McDonnell & Miller's 100,000-sq-ft Chicago production facility employs about 150 production workers and processes almost 300 orders each week. To support this work, the organization decided it would need 14 data entry stations — an ideal number for a single micro to support, Jung said.

After surveying products available, McDonnell & Miller chose Data Collection Systems, Inc. (DCSI) as its software vendor for the micro data collection system and purchased hardware that DCSI recommended. The organization's system configuration consisted of the following:

- Fourteen Intermec Corp. 1240 bar code wands, each attached to an Intermec 9320 electronic bar code reader. Employees pass the wands over bar code templates to enter data whenever they complete a job, and the readers decode the wands' analog signals.
- Two Intermec 9161 port concentrators that are hard wired to the wand readers and connected to a micro. Each concentrator has 64K bytes of random-access memory to buffer transactions when the micro is unavailable. One concentrator supports six wand readers; the other supports eight.
- Two IBM Personal Computer XTs, one for data collection through the port concentrators, the other for support processing. The processing microcomputer is fitted with an AST Research, Inc. 3780 bisynchronous card that allows it to upload and download data to and from McDonnell & Miller's 4331. Both the micro and the mainframe run RJE software that supports the data transfers.

When McDonnell & Miller first configured its system, DCSI recommended IBM equipment. The vendor has since approved ITT's Xtra micro as a suitable host, Jung said, and McDonnell & Miller plans to switch over to its parent company's product soon.

Regardless of hardware, the feature that makes the system operable is the DCSI software. Jung said the software maintains employee definitions, transaction contents and formats, inquiry requirements and support processing parameters. It also allows for the real-time collection of data from the wands throughout the workday and prohibits real-time entry when necessary.

At the end of each workday, for example, payroll personnel use utility routines in the software to check data that has been collected and correct any errors. When they have finished their corrections, they use another routine to close the data file and dump it to a floppy disk for transfer to the support processing

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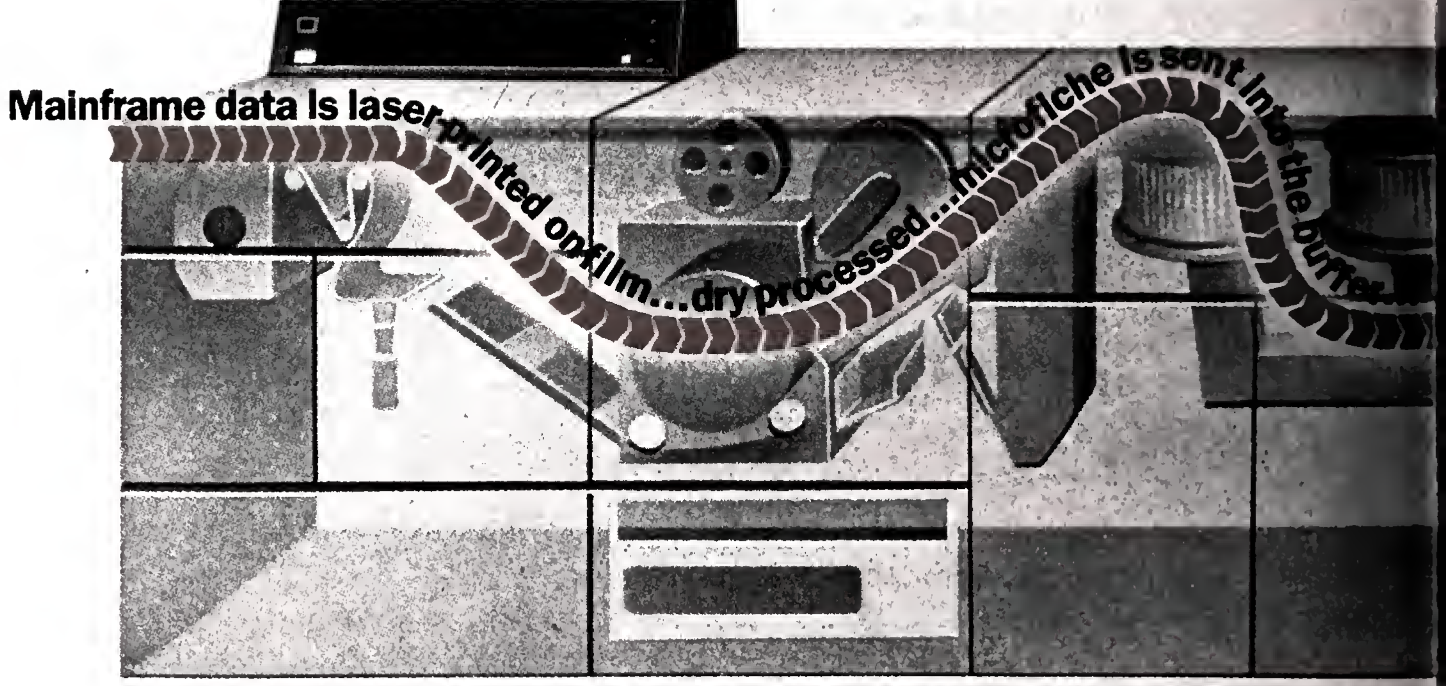
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micro. During both the inquiry and dumping operations, data from the time clocks cannot enter the machine.

The DCSI software also aided McDonnell & Miller in its transition from the manual system to the micro-based one, Jung said. The organization's employees used one of the software's utilities, for example, to customize the field and transaction definitions they needed for various shop floor transaction sequences.

During the transition McDonnell & Miller also wrote a program that would convert data that had been downloaded from the mainframe's IBM Copics data base into a format the bar code wand readers could understand.

Before the organization switched to its new system, staff members from the Advanced Technology Center helped it with preparatory tasks. They designed factory-hardened enclosures for the Intermec bar code equipment, for example, and created a training program for McDonnell & Miller's users.

The program, a slide presentation, includes an explanation of the system's purpose and the use of the bar code equipment and provides an outline of problems and how they should be solved. Jung said employees are instructed to contact their supervisors if any equipment problems arise.

To stimulate factory workers' interest, he said, McDonnell & Miller's management held a contest to name the data collection system. The name has not been chosen yet, but the contest succeeded in raising workers' enthusiasm. According to Stan Brzezicki, assistant controller at McDonnell & Miller, the switch to the new system has been extremely successful. The hardware and software have been running as expected, and users have accepted the change.

■

ITT data collection: A step-by-step process

ITT's manufacturing unit, ITT McDonnell & Miller, uses its data collection system as follows:

Work orders are downloaded from an IBM Copics data base on the organization's host mainframe to the support processing micro for output to a bar code printer.

The printer takes the downloaded data and prints work order sheets, which include job numbers, part numbers and other information that identifies shop floor tasks. The work order sheets also have a numerical template, the bar code equivalent of a numerical keypad, that workers use to record the quantities they produce.

Each time a worker completes a work order, he uses a bar code wand to record data about the task.

A reader attached to the wand decodes the wand's analog signal so it can be passed to the data collection micro.

The worker follows a specific sequence:

■ First, he makes a pass with the wand over his bar code employee badge.

■ Next, he makes a series of passes over bar code blocks on the work order printout: He passes the wand over the task's job number, the part number of the product on which he has done work and the operation number of the task, all of which are represented by individual bar code blocks.

■ After he identifies himself and his task, the worker makes passes with the wand over the numeric template to record the number of parts accepted and rejected.

■ Last, he makes a pass with the wand over a bar code Send command that transfers the shop floor information to the data collection micro.

After each pass, the reader beeps once to let the worker know the information has been accepted by the reader. After the last pass, the reader emits a series of beeps to let the worker know whether or not the transaction has been completed properly.

If the transaction is complete, the reader beeps twice; if not, the reader beeps four times and the worker must repeat the entire transaction.

The reader passes data from all completed transactions to one of two port concentrators, which timestamps the transactions and passes information on to the data collection micro.

The data collection micro accepts transaction data throughout the working day. At the end of each day, payroll employees check the transaction data, then close the data collection file and dump information from it to a floppy disk.

They load this disk into the support processing micro, which uploads the data to the host computer for processing.

Qantel users get pamphlet

Datawell, located in Reseda, Calif., has begun publishing "Quser News," a monthly pamphlet for users of Qantel Corp. computer systems.

The pamphlet reportedly includes articles on the operation of Qantel systems and programming tips. "Quser News" will also include a question-and-answer section and a calendar section.

Subscribers to "Quser News" may advertise for free in the publication, according to Datawell.

The first issue, with a projected size of eight to 12 pages, was scheduled to be mailed in August, Datawell said.

A year's subscription to "Quser News" costs $48.

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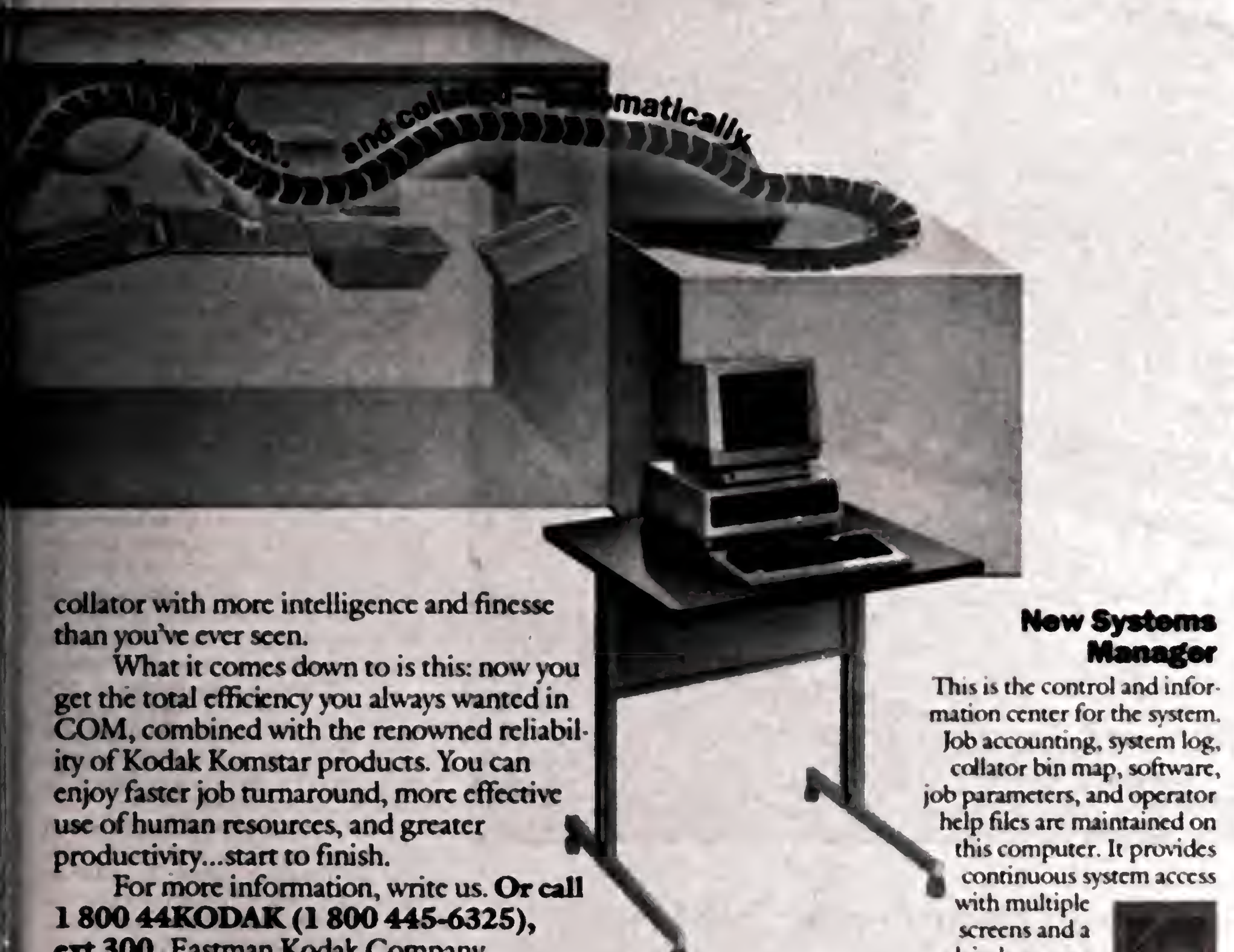

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Dairy condenses accounting time with ledger package

Off-the-shelf system keeps execs up to date

LIVONIA, Mich. — Accountants for a dairy products distributor here moved up their periodic financial closings by more than a week after the firm installed an off-the-shelf general ledger package.

Melody Farms Distributing Co., which delivers dairy products throughout Michigan, maintains a 13-period fiscal year and must close its books every four weeks. Until 1981, accountants armed with calculators managed to finish the work within two to three weeks after a period closed.

With the new general ledger software, from Executive Technology Data Systems, Inc., they finish the job within one week to ten days.

The quick closings allow Melody Farms executives to base their management decisions and marketing plans on more up-to-date information than they did previously, according to Philip Sattler, vice-president of information systems. Sattler said his firm originally planned to write its own general ledger software rather than purchase an off-the-shelf system, but changed its course after a frustrating 1980 experience with customized software development.

In that episode, Melody Farms had to pay a consulting company for more than four months of development work on three packages — order entry, route accounting and accounts receivable.

After the system was up and running on an IBM System/34 at Melody Farms, the consulting firm spent an additional eight months fixing bugs and making improvements on it, Sattler recalled. "If you can find software that can be modified to meet your needs, it is certainly the cheaper way to go."

But, Sattler added, "The problem was that a software package for Melody Farms had to meet several critical criteria." The firm decided that if it purchased a package, the software would have to have the following qualities:

- Be flexible enough to allow the controller and accounting department to structure general ledger account numbers in their own way.
- Allow the accounting department to work independent of the data processing department.
- Have source programs that were clean and consistent.

Melody Farms needed flexible software to enable its controller and his staff to number their accounts as they chose, rather than as a software system dictated, Sattler said. The firm runs several subsidiaries, including a production plant and a few financial companies, all with different types of accounts and financial statements.

Melody Farms' accountants had to be able to group the different accounts into cost centers as they saw fit. "With [the] parent company and subsidiaries requiring different financial statements, flexibility was a very important feature to us," he said.

Independence for the accountants was necessary, Sattler said, because he did not want them taking up MIS time with tasks that they could do on their own under a well-structured software system.

'At the vendor's mercy'

Consistent source code, with logic Melody Farms' programmers could understand, was a criterion, he said, because, "I don't want to be at the vendor's mercy." Sattler said he wanted to be able to modify the software on his own as the business' needs changed.

In 1981, Melody Farms purchased the general ledger package from Executive Technology Data Systems that met the three criteria, according to Sattler.

It proved to be flexible enough to run the parent company's and its subsidiaries' accounts and to accommodate acquisitions the firm has made since the software was purchased, he said. Last year, Melody Farms purchased a subzero warehouse and brought its accounts onto the general ledger system.

The software's source code, written in RPG-II, was easy to modify to meet Melody Farms' need for 13-period financial reporting, according to Sattler. He said that the package was set up for monthly reporting but that he changed it in one day to handle Melody Farms' reporting structure.

Sattler also added menus to the software so that the firm's accountants could set up reports they needed more easily. The accounting department now does almost all of its work without help from MIS.

"Our data processing department hasn't had to get involved in formatting financial statements or entering data," he said. "The accounting department sets up the statements and makes journal entries. All we do is make sure that everything is properly filed on disk storage and that we have backup copies on everything."

The package runs on a 256K-byte IBM System/34, one of two System/34s the firm operates. Melody Farms recently purchased an IBM System/36, but Sattler said he saw no need to transfer the general ledger to the new machine.

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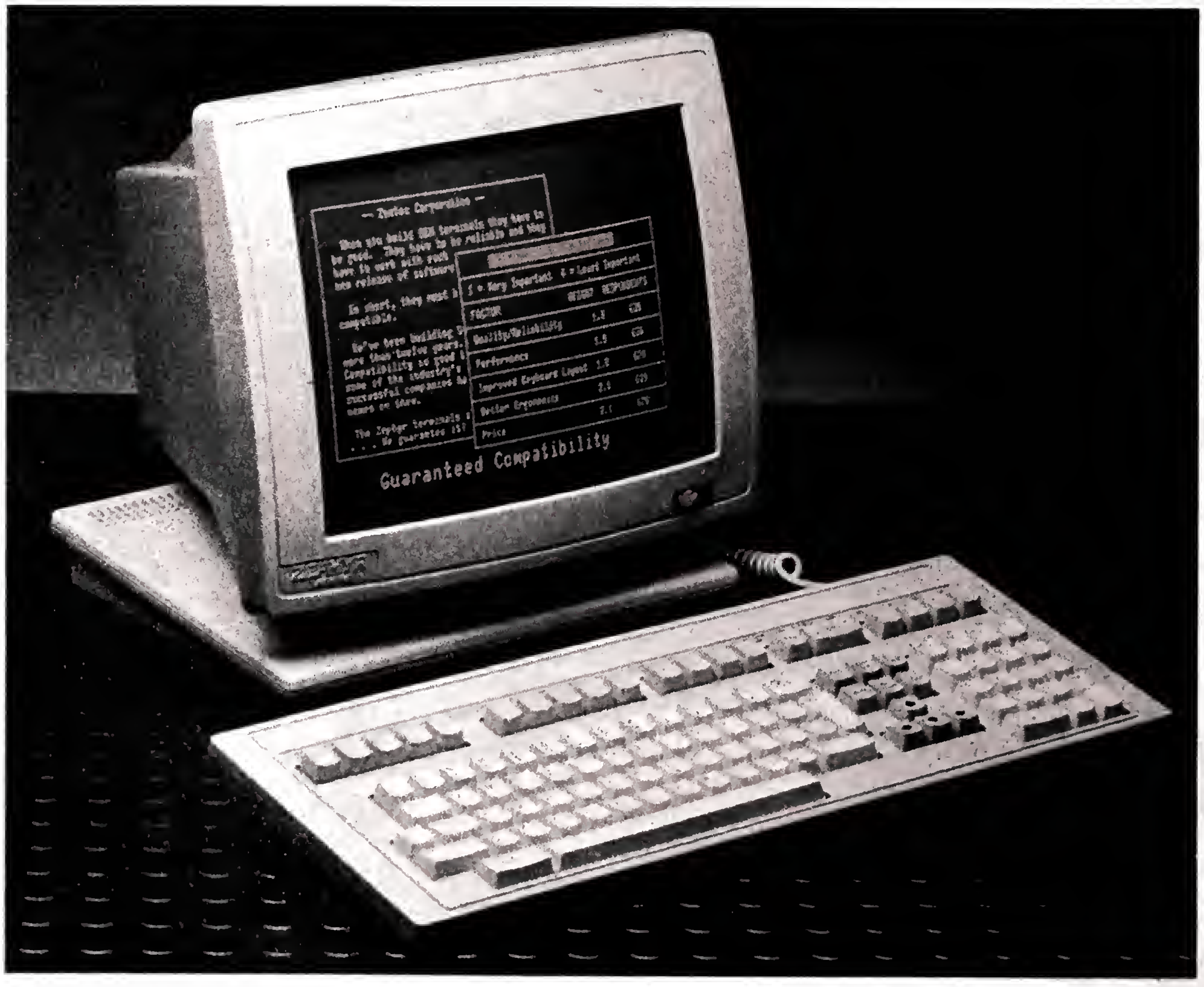

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EMC has just added a feature to add-in memory for IBM's System/38 that's been sorely lacking.

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But unlike IBM, we let you do it for $2,000 less. (IBM's price is $7,500, ours is just $5,500.)

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IBM, on the other hand, charges you a memory maintenance fee of more than $1,000 a year. Every year.

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If you even *suspect* a problem, just call our special toll-free hotline and we'll send you a new card *within 24 hours*—absolutely free.

And our new memory expansion card is *100% plug compatible* with the System/38. So it supports all IBM memory and memory diagnostic features. Installation takes just 10 to 15 minutes (you can even do it yourself) and does not affect your IBM maintenance coverage in any way.

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To let you do that *before* you buy, we've come up with a special trial offer for qualified System/38 owners. Just call or write EMC Corporation at 12 Mercer Road, Natick, MA 01760—and we'll install a "no maintenance" EMC memory board for you without cost or obligation.

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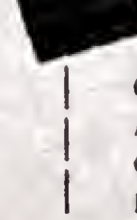

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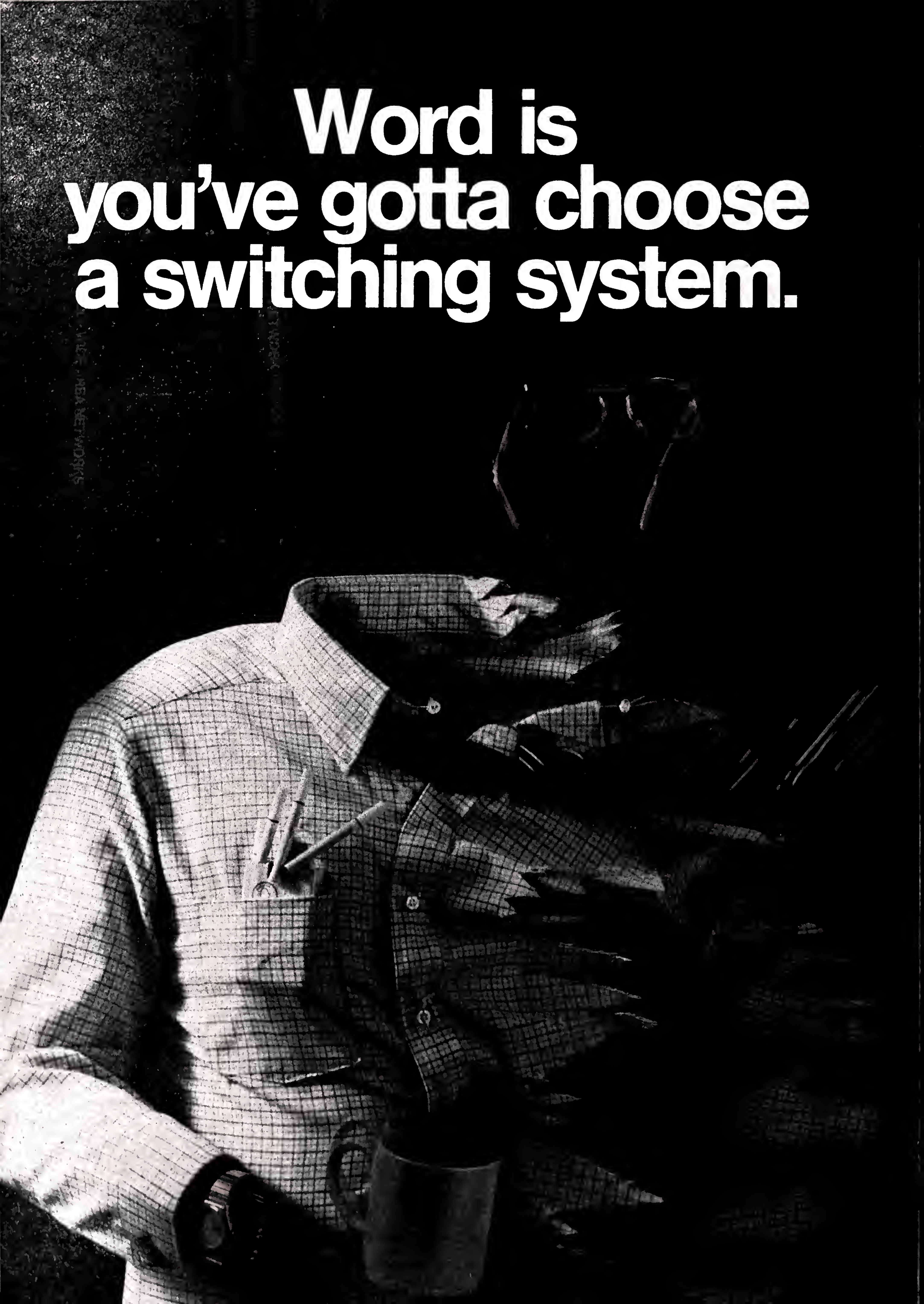
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MANAGERS ON THE MOVE

WALTER F. ROBINSON will head Mincron SBC Corp.'s Financial Services Industry consulting group. In this position he will oversee day-to-day technical operations and facilitate new business development.

Previously he managed Chemical Bank's World Banking systems group, provided strategic planning support to International Paper Co.'s corporate MIS organization and headed Procter & Gamble Co.'s internal consulting group for line marketing systems.

He has a B.S. in computer science and an MBA.

Mincron develops custom software systems and installs software packages for businesses using IBM System/34, 36 and 38 minicomputers.

■

HUGH K. SWITZER has been promoted to senior vice-president of MIS for Columbia Pictures Industries, Inc.

Switzer joined Columbia in January 1983 as vice-president of MIS.

Previously he was associated with American Express Co., where he was vice-president of information systems and data services for Warner Amex Cable Communications Co. from 1981-83 and vice-president of systems planning for corporate systems and telecommunications from 1977-81.

He graduated in 1960 with a B.S. degree from New York Maritime College.

■

The Internal Revenue Service announced the appointment of BERNARD F. MILLER as director of the new user assistance and computer capacity management office. In his position, Miller will be responsible for providing technical assistance to all functional areas on new automation technologies and helping users in developing automation plans that are consistent with the IRS' automation policies.

Miller began his career with the IRS in 1959 as a revenue officer in Hartford, Conn. In 1961 he transferred to the IRS national office in Washington, D.C. and has held a series of positions in data processing operations.

In 1981 he was named assistant director of the systems support division and in 1982 was appointed assistant director for the hardware division, a position he held until his present appointment.

He is a graduate of Bridgeport University in Bridgeport, Conn., with a bachelor's degree in accounting.

■

Jones, Carter Hawley Hale Stores

Carter Hawley Hale Stores, Inc.'s information services division has announced a number of organizational changes designed to strengthen the division's continuing support of Carter Hawley Hale's systems strategies.

WILLIAM F. JONES JR. has been promoted to executive vice-president of development and information management. Prior to his promotion, Jones was senior vice-president of development.

Carter Hawley Hale Stores' Spellman

WALTER H. SPELLMAN JR. has been promoted to senior vice-president of development and assumes responsibility for all Carter Hawley Hale's common systems development. Previously he served as divisional vice-president for store systems.

TROY T. NGUYEN was promoted to vice-president of merchandise systems. He was divisional vice-president of merchandise systems.

Carter Hawley Hale Stores' Menar

ROBERT M. MENAR has been promoted to executive vice-president of computing communications and planning. Menar had been senior vice-president of computing and communications.

NORMAN H. LEIBSON was promoted to vice-president of communications. He had served as divisional vice-president of communications.

Carter Hawley Hale operates 125 department stores and 154 specialty stores.

■

JULES SIEBURGH has been promoted to vice-president of information systems at Sonesta International Hotels Corp. Sieburgh will now manage all telecommunications activities in addition to his supervision of all DP for Sonesta.

He has been with Sonesta since 1978 when he installed a comprehensive property management computer system at the Sonesta Hotel in his native city, Amsterdam.

After successfully completing this project, he moved to Sonesta's corporate headquarters in Boston to assume the role of director of DP.

Prior to his promotion, he was responsible for the installation of property management systems at all Sonesta Hotels.

He has a B.S. in hotel administration and an MBA, both from Cornell University in Ithaca, N.Y.

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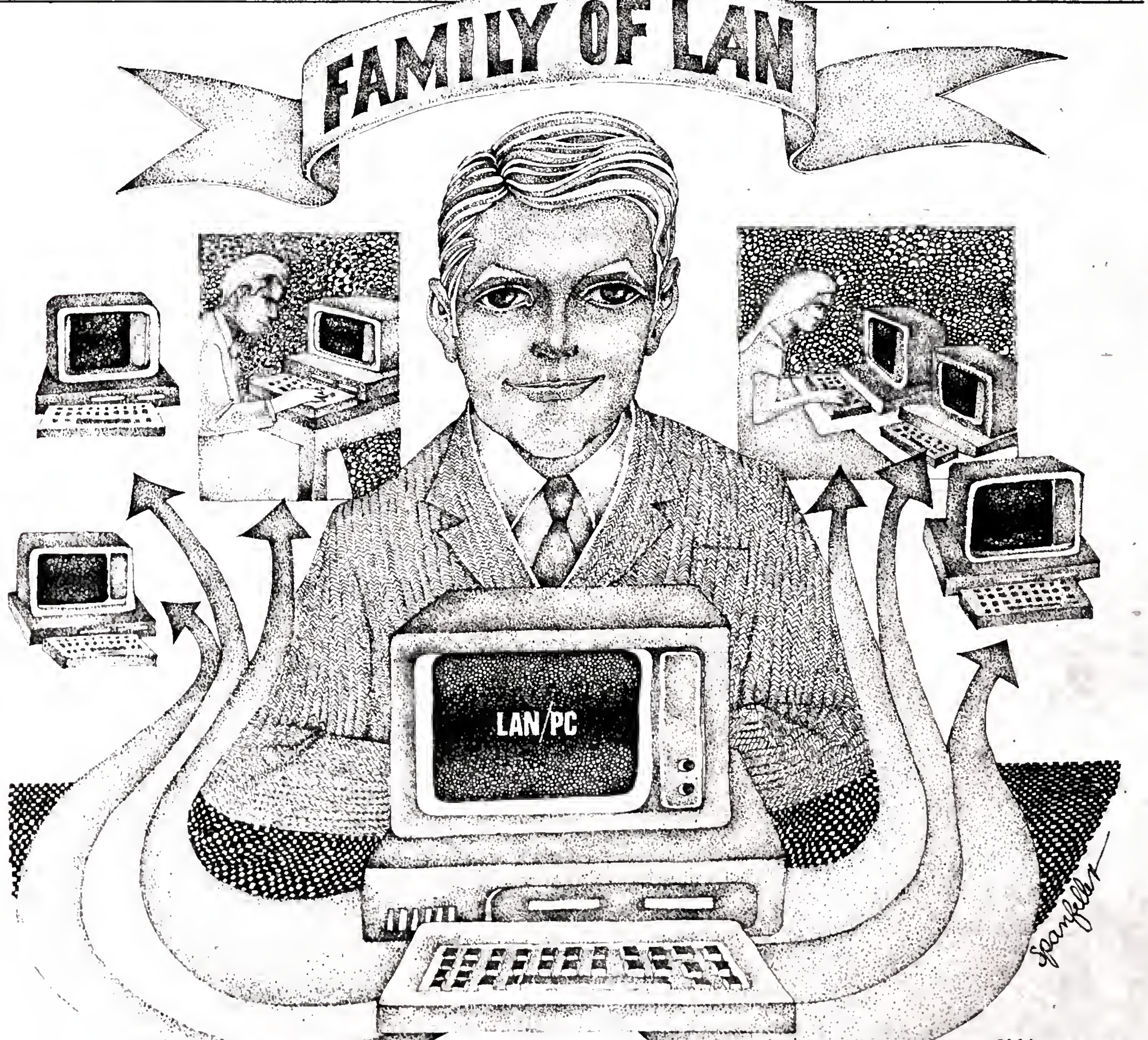
Or write to Interactive Systems/3M Response Center, Dept. 176E, 701 Decatur Ave. North, #205, Minneapolis, MN 55427.



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TURNAROUND TIME

Larry Long

Q During the past six years, I have worked my way up to manager of corporate systems. Until recently, I reported to the same boss that hired me, an executive vice-president.

I have been praised for growing with the increased responsibilities that my job required. I have never received a critical performance review or, for that matter, any constructive criticism.

I had only one computer course in college, so my computer education is mostly the result of on-the-job training. Two years ago, management discouraged me from taking graduate courses saying that I would learn no more than I could learn on the job.

Slightly more than a year ago, I hired someone with a master's degree in business administration and two years of experience as a programmer/analyst to be one of my managers.

Shortly after this person came on board, I received a memo from my boss stating that he would no longer report to me but to the president. I complained to my boss that after finally consolidating systems functions, we are fragmenting the department again.

Last month, my boss told me that a new position, called the director of MIS, had been created and would be filled by the person I had hired a year earlier.

I was also told that I would report to him and that most of the people that reported to me would now report to him and that he would report to the president.

On several occasions I have expressed my dissatisfaction with the organization to my new boss and have requested a revised job description that would demonstrate the company's desire for me to stay.

To date, I have received nothing but the assurances of the director of MIS that he wants me to stay. Could you suggest a strategy from this point?

It appears that you may be the victim of what I call the "gopher-to-vice-president phenomenon." This phenomenon occurs with surprising frequency in every variety of business endeavor.

Here's how it works. The president selects one of the top (usually, but not always, *the* top) young prospects to work directly with him on special projects. The gopher does a bang-up job (or the president believes this to be the case) and is made an assistant to the president. The next promotion is to something like assistant vice-president, followed shortly thereafter by a jump to, you guessed it — vice-president.

Your current boss was simply at the right place at the right time.

There are definite advantages to rubbing shoulders with people in power positions. When a president or a vice-president needs someone in a hurry, the successful candidate is often within earshot.

To be sure, the change of power could have been handled more tactfully, but because of political exigencies, the situation may be irreversible. Reemphasize your concerns about your future with the company, then wait a reasonable period of time for a response.

In the interim, however, I would suggest that you update your resume, maintain good relationships with your colleagues and adopt a strategy that you are willing to leave if the right opportunity comes along.

Q After graduation, I took a job with a computer company and just had my six-month evaluation. Overall, my performance was rated as average, but all of the discussion centered on my attitude, dress and hairstyle, not on my job performance.

During my sales training period, everyone gave me the impression that I was progressing at an accelerated rate, so my evaluation came as a surprise.

My evaluation was essentially a reflection of what my manager thought of my appearance. I wear a coat and tie and try to be neat. He told me that being neat was not good enough and that I should invest in some new clothes.

I would prefer to spend my money on other things. How can I convince him that clothes are not one of my priorities?

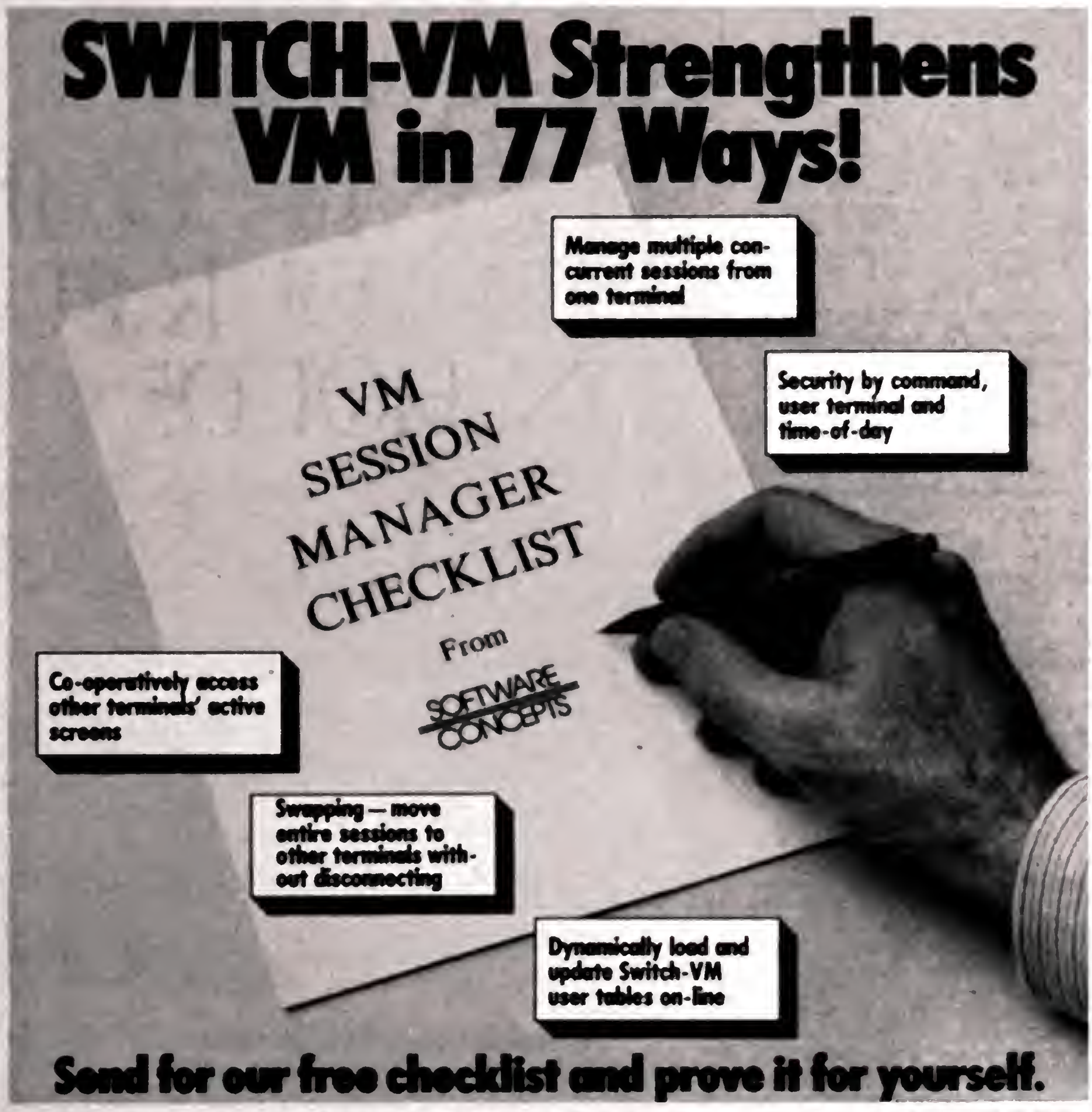
If being a successful computer salesman is one your priorities, then I would suggest that you rethink your priorities. Your manager was wrong to have downgraded your overall performance based solely on mode of dress, but he wanted to stress the importance of appearance.

Most jobs require some kind of personal concessions. Professionals that meet frequently with high-level customers and clients have found that adopting a traditional and conservative mode of dress generally yields the best results.

How you dress does not help you make a sale; it can, however, knock you out of the running.

The idea behind conservative dress is to help minimize the possibility of unnecessry objections so that the customer or client will focus on what you have to say or sell.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*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CALENDAR

WEEK OF OCTOBER 6

OCTOBER 6-8, SAN FRANCISCO — **Solid Modeling '85: Making CAD/CAM Pay Back.** Contact: Jacquelin Cooper, "CAD/CIM Alert," 824 Boylston St., Chestnut Hill, Mass. 02167.

OCTOBER 7-9, NEW YORK — **VM for Systems Programmers.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 7-10, LOS ANGELES — **CICS Command-Level Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 7-11, BELLEVUE, WASH. — **C Programming Workshop.** Contact: David Cheyette, Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

OCTOBER 7-11, KING OF PRUSSIA, PA. — **CICS/VS Command-Level Programming.** Contact: Ned Frey, Computer Assistance, Inc., Suite 480, 1150 First Ave., King of Prussia, Pa. 19406.

OCTOBER 7-11, LOS ANGELES — **Basic Systems Analysis.** Contact: Thomas J. Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Oct. 7-11 in Calgary, Alta.

OCTOBER 7-11, LOS ANGELES — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 7-11, NEW YORK — **CICS Macro-Level Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 7-10, DENVER — **Using Microcomputers in Government.** Contact: Conference Manager, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

OCTOBER 8-9, MINNEAPOLIS — **Tenth Conference on Local Computer Networks.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

OCTOBER 8-10, TOPEKA, KAN. — **DSSD Users' Conference — Feedback '85.** Contact: Ken Orr & Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

OCTOBER 8-12, NANJING — **Autoinfo China '85.** Contact: American Export Group International Services, Inc., Watergate 2600, 2600 Virginia Ave. N.W., Washington, D.C. 20037.

OCTOBER 9-10, CHICAGO — **The Financial Supermarket: New Fee Income Opportunities for Banks & Thrifts.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

OCTOBER 9-11, BOSTON — **Robots East.** Contact: Robotic Industries Association, P.O. Box 1366, Dearborn, Mich. 48121

OCTOBER 10, NEW YORK — **Vtam Operations Workshop.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

WEEK OF OCTOBER 13

OCTOBER 13-16, WASHINGTON, D.C. — **Information Science, Inc.'s 16th International Users Conference on Human Resource Management.** Contact: Information Science, Inc., 95 Chestnut Ridge Road, Montvale, N.J. 07645.

OCTOBER 14-15, SAN FRANCISCO — **Direct Response Marketing for Financial Institutions: Telemarketing, Direct Mail & Sales Training.** Contact: Alice Gibons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925. Also being held Oct. 21-22 in Los Angeles.

OCTOBER 14-16, PHILADELPHIA — **Managing Application Software Support Workshop.** Contact: Infosci, Inc., Box 7117, Menlo Park, Calif. 94026.

OCTOBER 14-17, NEW YORK — **Info '85 — Information Management Exposition & Conference.** Contact: Cahners Exposition Group, Client Services, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

OCTOBER 14-18, BOSTON — **Management Workshop.** Contact: Judy Trelogan, Arthur Young & Co. 1950 Roland Clarke Place, Reston, Va. 22091.

OCTOBER 14-18, NEW YORK — **Structured Systems Analysis Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 15, CHICAGO — **Transacting Business Electronically: Insights Into a Rapidly Changing Field.** Contact: Chi/Cor Information Management, Inc., 10 Riverside Plaza, Chicago, Ill. 60606.

OCTOBER 15-16, NEW YORK — **IMS Recovery Restart.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 15-17, NEW YORK — **Implementing SNA.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 15-17, WASHINGTON, D.C. — **Data Base: A Manager's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 15-17, WASHINGTON, D.C. — **The Micro-Mainframe Connection.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

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OCTOBER 15-18, HOUSTON — **CMC '85 and A/E Systems — Fall.** Contact: Conference Director, CMC '85 and A/E Systems — Fall, P.O. Box 11318, Newington, Conn. 06111.

OCTOBER 16-17, LOS ANGELES — **The Yates Second Annual Unix Market Forum.** Contact: Yates Ventures, Suite 201, 3350 Bayshore Road, Palo Alto, Calif. 94303.

OCTOBER 17-18, DENVER — **Federal ADP and Telecommunications Procurement.** Contact: International Data Corp., Washington Division, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102. Also being held Oct. 31 to Nov. 1 in San Antonio and Nov. 14-15 in McLean, Va.

OCTOBER 17-18, NEW YORK — **VS Cobol II.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 17-18, PHILADELPHIA — **Rapid Prototyping Workshop.** Contact: Infosci, Inc., Box 7117, Menlo Park, Calif. 94026.

OCTOBER 17-18, ATLANTIC CITY, N.J. — **The Third Annual NCR Users Eastern America Conference.** Contact: Jack Hibberd, A.D.R., Inc., P.O. Box 429, Willow Grove, Pa. 19090.

WEEK OF OCTOBER 20

OCTOBER 21-23, SAN FRANCISCO — **Lamond on IBM.** Contact: Reggi Veatch, National Marketing, Suite E-1A, Standard Court East, 9160 Red Branch Road, Columbia, Md. 21045. Also being held Oct. 29-31 in Dallas and Nov. 4-6 in Boston.

OCTOBER 21-23, BOSTON — **Hammer Forum '85: Shaping the Second Revolution in End-User Computing.** Contact: Hammer and Co., Hammer Forum, 5 Cambridge Center, Cambridge, Mass. 02142.

OCTOBER 21-23, WASHINGTON, D.C. — **Controlling Software Projects: Management, Measurement and Estimation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Dec. 9-11 in Dallas.

OCTOBER 21-24, CHICAGO — **Systems & Applied Technology Conference & Exhibition (Satech '85).** Contact: Satech '85, 2472 Eastman Ave., No. 34, Ventura, Calif. 93003.

OCTOBER 21-24, PITTSBURGH — **Work Measurement Techniques Workshop Series.** Contact: Institute of Industrial Engineers, Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

OCTOBER 21-25, NEW YORK — **Comprehensive Course in Data Communications.** Contact: *Data Communications*, Special Projects Conference Management Center, c/o Information-Breakthroughs, Inc., 445 W. Main St., Wyckoff, N.J. 07481. Also being held Nov. 18-22 in Lake Buena Vista, Fla.

OCTOBER 21-25, WASHINGTON, D.C. — **Ada Software Engineering Workshop.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Oct. 28 to Nov. 1 in Los Angeles.

OCTOBER 21-25, BOSTON — **Analysis Workshop.** Contact: Judy Trelogan, Arthur Young & Co., 1950 Roland Clarke Place, Reston, Va. 22091.

OCTOBER 21-25, CHICAGO — **CICS Macro-Level Programming.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 21-25, NEW YORK — **Structured Systems Design Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 22-23, BOSTON — **Developing End-of-Arm Tooling for Industrial Robots.** Contact: Robotics International of the Society of Manufacturing Engineers (SME), P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

OCTOBER 22-25, SAN FRANCISCO — **Worldcom '85 — World Communications and Computers: 1985-2000 Conference and Exhibit.** Contact: International Council for Planning and Innovation, P.O. Box 17392, Washington, D.C. 20041.

OCTOBER 22-25, DENVER — **Data Base: A Builder's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Nov. 12-15 in Dallas and Dec 3-6 in Washington, D.C.

OCTOBER 22-26, SAN FRANCISCO — **Fifth Multinational Conference on World Communications and Computers.** Contact: International Council for Planning, P.O. Box 17392, Washington, D.C. 20041.

OCTOBER 23-25, NEW YORK — **Strategies for Office Automation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held March 11-13 in Boston.

OCTOBER 24, NEW YORK — **DOS/VSE for Systems Programmers.** Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 24-25, LOS ANGELES — **Local-Area Networks: Selection and Implementation.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

OCTOBER 24-25, SAN FRANCISCO — **PC as a Programmer/Analyst Workstation.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810. Also being held Nov. 21-22 in Washington, D.C. and Dec. 12-13 in Boston.

OCTOBER 24-25, SAN FRANCISCO — **Lamond — The IBM PC.** Contact: Reggie Veatch, National Marketing, Suite E-1A, Standard Court East, 99160 Red Branch Road, Columbia, Md. 21045. Also being held Nov. 7-8 in Boston.

OCTOBER 25-27, FRANKFURT — **The Forth Modification Laboratory Conference.** Contact: Forth Interest Group, P.O. Box 8231, San Jose, Calif. 95155.

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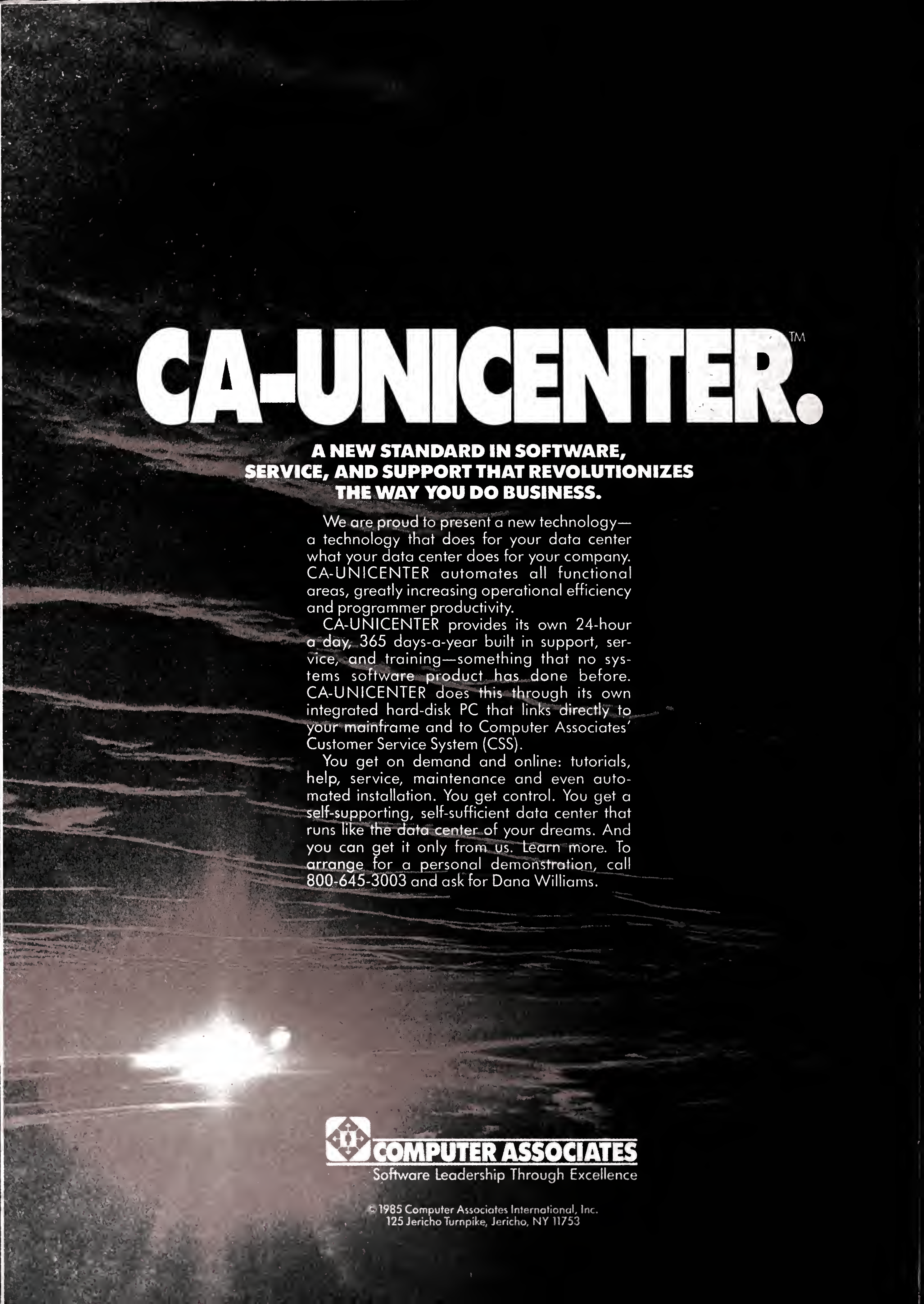

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SOFTWARE & SERVICES

M&D micro-mainframe link eases insurer's reporting woes

By Maura McEnaney

FAIRFIELD, Conn. — While microcomputer users in the financial and management reporting groups of the Orion Group were finding their micros valuable for analysis, the company's information center manager concluded that too much time was being spent keying data from the mainframe into spreadsheets.

"They spent too much time on things that analysts just don't do," according to Orion Information Center Manager Scott Stein. He decided the firm needed to implement a micro-mainframe link, but he had to sell the idea to the management of the national property and casualty insurance company.

Researching potential micro-mainframe products was Stein's first assignment. He began looking for micro-mainframe links that would allow Orion analysts to extract and transfer data subsets from the corporate financial data base to Lotus Development Corp.'s 1-2-3 running on IBM Personal Computer XTs. The company's choice was limited by its use of a data base and application systems developed in-house, Stein said.

The data base held more than 1 billion records, and users needed to pull down subsets of data — not entire files. According to Stein, of the three types of links available — terminal emulators, file transfer products and universal links — only the universal products were suitable.

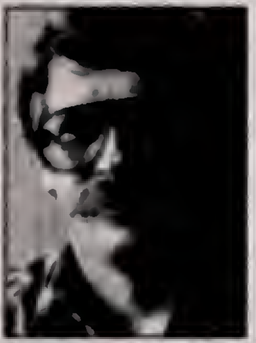
Although fourth-generation languages could give users sophisticated query and transfer capabilities, "they lock you into [vendor] data bases," Stein said. "On top of that you spend $150,000 for the pack-

Continued on page 74

Users like PC Link, not price

BOSTON — Users of McCormack & Dodge Corp.'s Interactive PC Link micro-mainframe link package interviewed at the World '85 users conference held here recently raved about the product's capabilities, but they wished it cost less.

M&D released PC Link in November 1983. The company modifies a Digital Consulting Associates, Inc. Irma board to support M&D applications and sells it with documentation for $2,200. The mainframe side of PC Link, for IBM IMS data bases in CICS environments, is priced at $25,000. For those customers who already have Irma boards installed on their IBM Personal Computers, the micro software and documentation is priced at $1,195.


Smith, Albuquerque Federal Savings and Loan

PC Link was upgraded to Version 2 in January of this year, and Version 3 is in development, the company said. Some 1,500 PC Link packages have been shipped to 200 clients, according to Scott Conrad, who markets the product for M&D.

PC Link user Larry Erb, a project manager in the systems area for Forest Oil Corp. of Denver, said the product has worked very well in his company. However, he said, "they are priced higher than is realistic." Because micro-mainframe technology is changing rapidly and no standards are emerging, "it's almost like [the PC Link micro software] should be a throw-in," Erb said.

Since Forest Oil is a Software AG Adabas data base management sys-

Continued on page 70

SOFTALK
John Gallant
CW Senior Editor

Will IBM take AI by storm?

Artificial intelligence and the information center concept provide an interesting contrast in style — IBM's style, that is.

Both AI and information centers have been in the news recently in the wake of the International Joint Conference on Artificial Intelligence (IJCAI) and the Information Center Conference & Exposition. The gatherings, though small compared with wider market shows like the National Computer Conference or Comdex, served to highlight the intense interest in their respective topics of concentration.

AI and information centers are hot for one very simple reason. Each holds the promise of addressing problems that traditional technologies or approaches have failed to solve. For that reason, both conferences drew aware, interested attendees and fostered an atmosphere of intense, constructive discussion. There were many topics to be debated and a great deal of information and newly won experience to be shared. With good reason, professionals in each area — whose job titles are still taking shape — see themselves as pioneers.

But IBM's role in the fields of artificial intelligence and information centers is a study in opposites. When it comes to information centers, IBM has been a leader. In AI, IBM has been something else altogether.

Wearing the weathered hat of the pioneer, IBM — actually, IBM's Canadian counterpart — unveiled the concept of the information center. The information center was designed to meet two very pressing needs, needs that are no less critical today.

The information center was geared

Continued on page 62

- Uccel added to its Synova series/**64**
- Martin Marietta enhanced Ramis II English/**64**
- Informatics compressed Cullinet's IDMS data base/**69**

INSIDE

Application Packages/**69**
DBMS/**69**
Languages/**69**
Training/**70**

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SOFTSCOPE

Notes from the software industry front

The Hartford Insurance Group and **Wang Laboratories, Inc.** have agreed to develop and market integrated computer products and services aimed at enhancing DP productivity in large organizations. The Hartford has formed a subsidiary, Hartford Integrated Technologies, Inc. to develop the products.

■

Teknowledge, Inc. and **Digital Equipment Corp.** have announced an agreement that allows DEC to market, sell and distribute Teknowledge's S.1 knowledge development software for the VAX processor family. Teknowledge's recent announcement of S.1 Version 2 is said to integrate further knowledge-system technology into VAX and Microvax environments.

■

Apollo Computer, Inc. has announced five software supplier agreements for artificial intelligence-related products on its Domain workstations. Agreements were reached with the following: **Quintus Computer Systems, Inc.**, which markets Quintus Prolog; **Logicware, Inc.**, marketing Mprolog; **Production Systems Technologies, Inc.** marketing the OPS83 expert systems language; **Software Architecture and Engineering, Inc.**, marketing the Knowledge Engineering System expert system development tool; **and CCA Uniworks, Inc.**, marketing CCA Emacs, an intelligent real-time display editor.

■

Signal Technology, Inc. has announced that its Smartstar fourth-generation application development and data management system for VAX processors will be co-sold as part of DEC's Digital Classified Software program. Smartstar is said to be the only independently developed information management system that interfaces with DEC's Relational data base system.

■

Data General Corp. has announced that **Intersystems Corp.'s** "M," a systems software package combining the Ansi-standard Mumps programming language with utilities and data base software, will be available through DG's Independent Software Vendor program.

■

Intercontinental Hotels, Inc. has announced the development of a Group Sales data base system to be designed and implemented by **Multi Soft, Inc.**, the applications development and marketing subsidiary of **Multi Solutions, Inc.** of Lawrenceville, N.J.

Inference enhances ART development environment

Improves graphics, adds interfaces

Inference Corp., based in Los Angeles, has announced enhancements to its Automated Reasoning Tool (ART), a large-scale expert system development environment for end users and developers using artificial intelligence workstations from Symbolics, Inc., Lisp Machines, Inc. or Texas Instruments, Inc.

Added capabilities include improved color graphics, a graphics icon library, direct interactive and programmer interfaces to the knowledge data base, support for mixed initiative processing, a pseudo-natural-language syntax and separately compilable rule files.

The ART rule-based expert system framework is said to support integrated forward and backward chaining in order to optimize search strategies.

Knowledge language

The ART knowledge representation language allows developers to manage complexity through knowledge abstraction based on hierarchically structured facts, relationships and rules, according to a vendor spokesman.

The enhanced product's Viewpoints feature provides a way to evaluate multiple alternatives, rather than assigning artificial probabilities to decision points.

The Artist graphics environment is said to simplify the addition of images in an application by providing a set of drawing primitives controlled by rules in the knowledge base. The Artist features have been extended with color graphics and an icon library of predefined symbols.

Art Studio

The Art Studio development environment has been enhanced to provide added ways to view a knowledge base. An advanced browsing facility shows graphical views of hierarchical relationships.

A pseudo-natural-language syntax option reportedly simplifies the use of ART by allowing the developer to build a knowledge base readable in English-like syntax.

The mixed initiative processing allows an expert system developed in ART to prompt uses for information while reacting to user inquiries.

The ART system is priced at $85,000.

From page 61

Will IBM take AI by storm?

to help data processing reduce the massive applications backlog by giving users the resources and the expertise needed to build some systems on their own.

It was also intended to provide a focal point for management of the growing population of microcomputers within large companies. Information center personnel would tackle issues of personal computer hardware and software selection, installation and support and training of end users.

Thus they would allow DP pros to address more complex, technical problems.

IBM not only gave birth to the information center idea — it also has provided a variety of products that are mainstays in the information centers of today.

A prime example is the VM/CMS operating environment. Other important products include the Structured Query Language, the Professional Office Systems and DB2, IBM's relational data base management system entry which, despite initial criticism from analysts, has received good marks from users.

Horse of a different color

But AI is the proverbial horse of a different color — and, until recently, that color has not been blue.

According to AI aficionados, who, like descendants of the Pilgrims, take great pride in tracing their roots back to the beginning, artificial intelligence was a dirty word to IBM.

As they tell the story, Big Blue did not even acknowledge the field of AI until it became evident that customers were aware of AI developments and were willing to put out the cash — to vendors other than IBM — to experiment with AI and even implement some first-generation applications.

Even now that IBM has entered the commercial AI market, the criticism continues.

Sure, worried vendors say that IBM has validated or endorsed artificial intelligence with the introduction of systems like the Expert System Environment/VM and VM Programming in Logic [CW, Aug. 19].

But others in the field say that IBM's products are clearly less than state of the art and are designed only to keep users from straying to the same vendors clamoring about validation.

Dire predictions

Some in the AI field are making dire predictions about how IBM's entry will impact the pioneers, the vendors who were willing to take on the tasks deemed too insignificant by the big guys until now.

The restructuring of the AI market that is sure to happen may be painful, but it will certainly be interesting to observe. It's an unavoidable phase in AI's maturity, after all.

What's more, the negative assessment of IBM's performance in the AI field may be too harsh. It's true that IBM hasn't offered many commercial AI tools, but it has exhibited some fairly impressive AI research efforts. In all fairness, no one can expect IBM to be all things to all people.

But it is interesting to note IBM's approach to two of the most important areas of information processing today.

Only the future will tell whether IBM will take on the mantle of innovator in the field of AI or whether fears of a repeat of its shuddering impact on the personal computer market will be realized.

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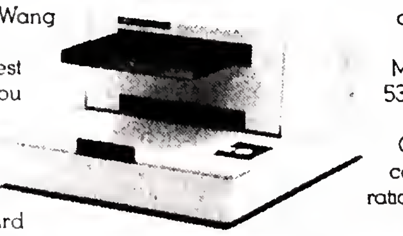
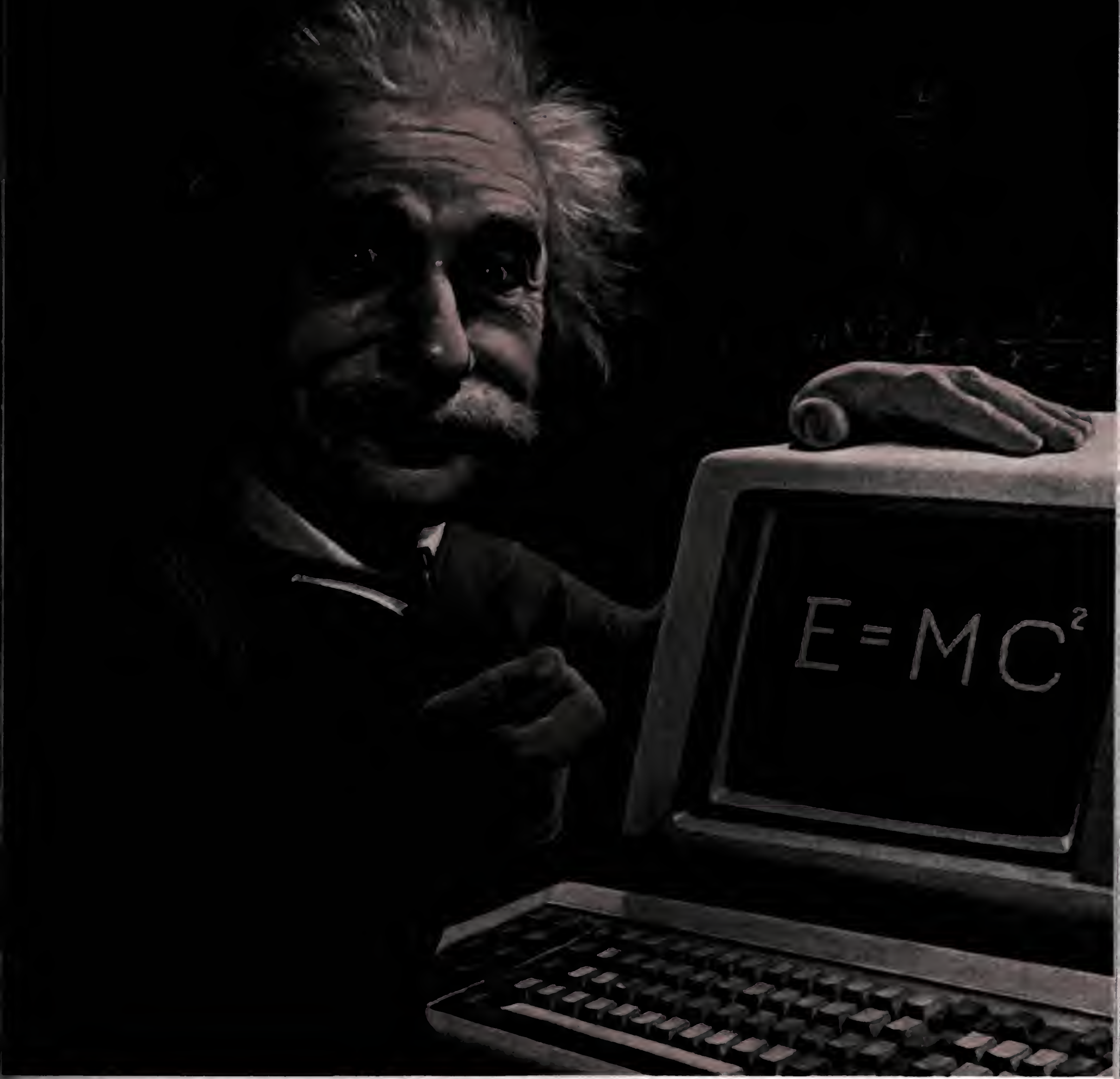


How to find the formula.



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Capacity planning modules out for Synova

Following up its June announcement of the Synova series, which is aimed at helping users integrate Uccel Corp. systems products with common logon, communications and command facilities, New York-based Uccel last week announced two capacity planning modules for the series.

The company announced Nova: Probe Resource Profiling Facility and Nova: Plan Capacity Modeling Facility.

The packages enable IBM mainframe users with MVS to model the impact of work-load changes on performance prior to allocating resources, a spokesman said.

The capacity planning model is based on data from standard data center monitors.

Model use

Capacity planners use the model to assess the effect of such measures as adding new batch or on-line work loads, expanding use of existing applications or increasing storage or CPU cycles.

Nova: Probe is priced at $12,500, and Nova: Plan is priced at $20,000. Together, the packages are priced at $26,000. Both are available immediately.

The Synova series was announced at Uccel's Systems Software Conference in Dallas.

Most Uccel software is integrated at the product level, with each package having limited predefined interfaces.

Layered architecture

The Synova series reportedly allows for full integration using a layered architecture, through which all commands and requests for data are controlled.

Other products in the series are Nova:Log, scheduled for September availability, and Nova:Save, which provides for the automatic backup of data stored on an IBM Personal Computer hard disk.

The products are said to be the result of a two-year research and development effort.

Enhanced Ramis II announced

Martin Marietta Data Systems of Princeton, N.J., has announced an enhanced Ramis II English release that reportedly improves the product's fluency and ease-of-use characteristics.

The company's Ramis II English natural language comprehension component adds artificial intelligence capabilities to the Ramis II fourth-generation language and data base management system, a spokesman said.

Release 2 of Ramis II English includes added ability to display information in graphics form using conversational English. Information can be displayed in either low-resolution graphics or high-resolution graphics on terminals from IBM, Tektronix, Inc. and Hewlett-Packard Co.

Graphics available for display include pie charts, histograms, bar charts, line graphs and point graphics.

Data and time references

The enhanced release is also said to improve date and time references. Information can be displayed and printed using conversational requests that include references to relative time and a variety of date patterns.

Users do not need to match dates in their request with the way dates are formatted in a data base.

The product's vocabulary has been extended with an additional 1,000 root words, bringing the total vocabulary to more than 5,000 root words.

The price for Release 2 of Ramis II English ranges from $13,500 to $27,000, depending on CPU.

Martin Marietta also announced that its Maxicalc II on-line electronic spreadsheet for IBM mainframes in the CICS environment now supports IBM's newly announced 3179 Model G color graphics terminal.

Maxicalc II is priced at $9,000 for DOS and $12,000 for OS operating systems.

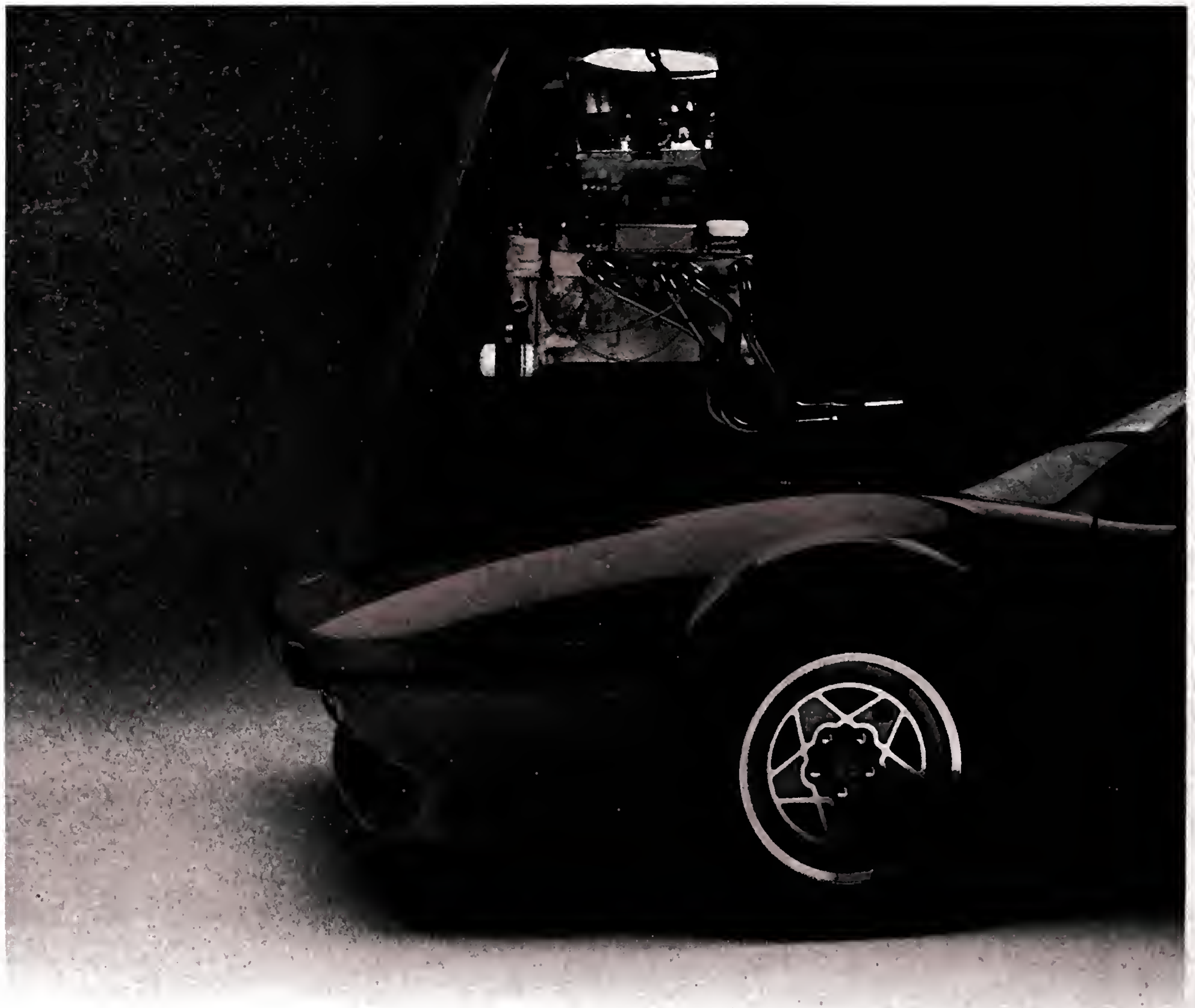
Henco Software tool gets DG port

Henco Software, Inc., which is based in Waltham, Mass., has announced that its Info data management system and applications development tool has been ported to the Data General Corp. Eclipse/MV, Dasher/One and Data General/One series processors.

Info operates in conjunction with DG's Comprehensive Electronic Office system.

Henco was selected as the first member of DG's Authorized Software Vendor progam in February.

Info on the DG systems ranges in price from $14,300 to $30,000 for the Eclipse/MV family. The system costs $1,200 for the DG/One and Dasher/One systems.



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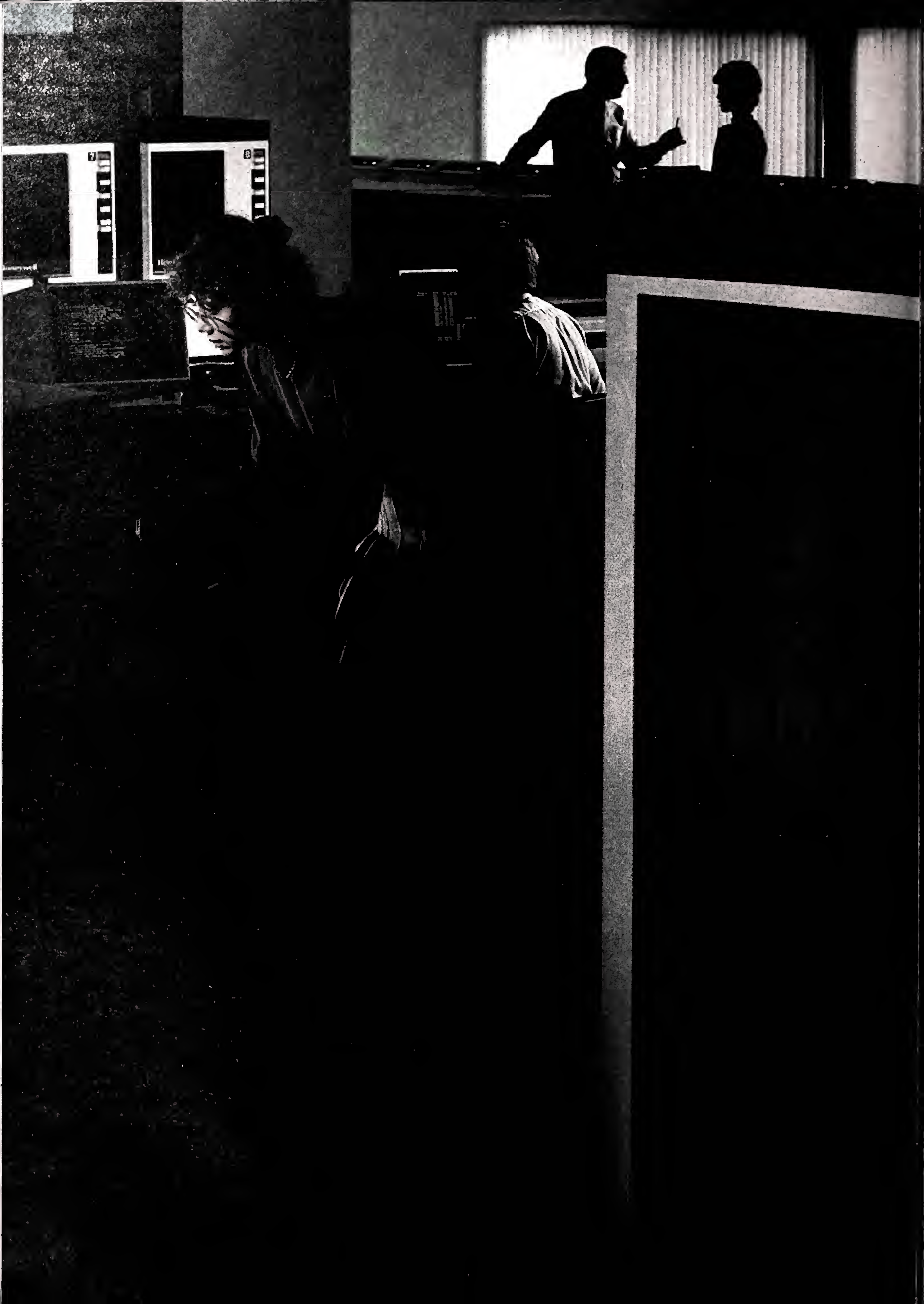

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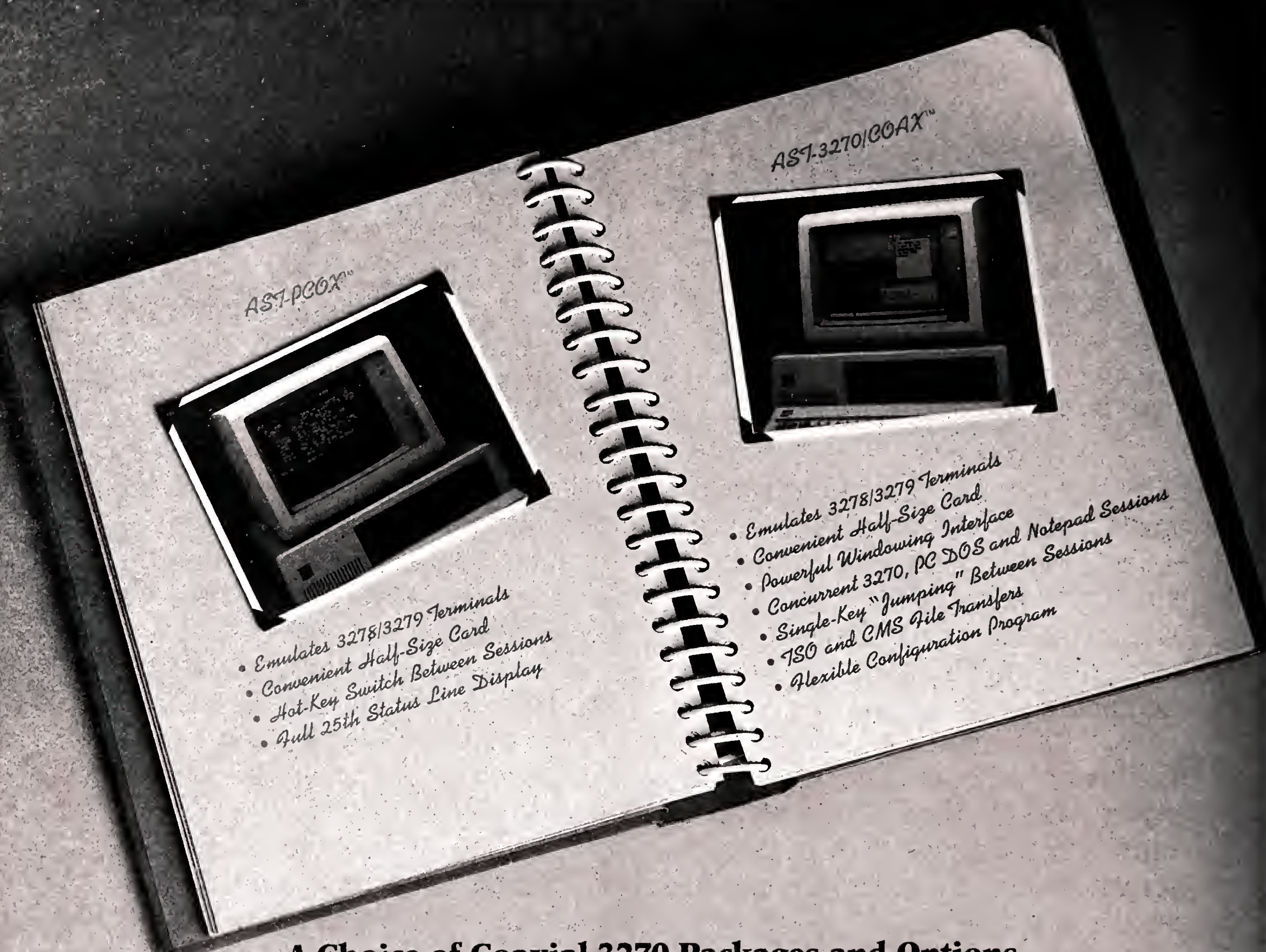
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APPLICATION PACKAGES

■ **Applied Computer Services, Inc. has announced that its software for the credit union industry now runs on the IBM System/36.**

Previously available on the IBM System/34, Credit Union Solution software is an accounting system that provides functions for stock shares, drafts, certificates of deposit, loans and Individual Retirement Accounts. The software permits process accounting for branch operations and can be used to account for automated teller machine networks.

The Credit Union Solution is priced from $12,000 to $40,000.

Applied Computer Services, Suite 209, 2343 E. Broadway, Tucson, Ariz.

DATA BASE MANAGEMENT SYSTEMS

■ **SAS Institute, Inc. has introduced an interface for its SAS System software and its System 2000 data base management system (DBMS).**

The interface incorporates a prewritten procedure that selectively converts data base items and records into a permanent or temporary SAS data set. The interface, which is included in base SAS software under IBM's OS and CMS, allows users to select data from the data base using a full screen menu within an SAS session. The data can then be used for graphics, reporting and analysis.

First-year license for SAS software is $8,000. System 2000 DBMS is priced at $12,000.

SAS Institute, Box 8000, SAS Circle, Cary, N.C., 27511.

Informatics offers IDMS storage tool

Informatics General Corp. of Canoga Park, Calif., has announced mainframe software that is reported to compress and encrypt the data stored in Cullinet Software, Inc.'s IDMS data base management system by up to 80%.

Shrink/IDMS is intended to reduce the amount of disk space required to stored IDMS data bases, a spokesman said.

The product is an addition to the company's line of file compression products that includes Shrink/IMS for compression of IBM IMS data bases.

Shrink/IDMS has an error redundancy checking feature. The package is available under IBM's MVS and MVS/XA operating systems and will execute in batch and on-line modes under IBM's CICS/VS, TSO and IDMS/DC.

The product requires no changes to existing IDMS application programs, according to an Informatics spokesman.

The price for Shrink/IDMS is $65,000.

LANGUAGES

■ **Touch Technologies, Inc. has announced an enhanced version of its fourth-generation language for Digital Equipment Corp.'s VAX series.**

The new version of the Intouch language is said to include screen management facilities and extensions for applications development. The product is also said to extract and manipulate data, regardless of the way the data is stored.

The cost of enhanced Intouch is $7,500 for the VAX-11/730 and Microvax II, $15,000 for the VAX-11/750, $25,000 for the VAX-11/780 and 11/785, and $40,000 for the VAX 8600.

Touch Technologies, Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.

■ **Sun Microsystems, Inc. has announced a version of Lucid, Inc.'s Portable Common Lisp AI programming language for the Sun family of workstations.**

Sun Common Lisp is enhanced with tools to optimize its performance on Sun workstations and to integrate Lisp capabilities into Sun's AT&T Unix programming environment, a spokesman said.

The Sun Workstation computer systems with Sun Common Lisp range in price from $8,900 to $50,000. Sun Common Lisp is said to be a full implementation of Common Lisp. All programs written in Sun Common Lisp can use the interactive windowing and graphics capabilities of Sun workstations. Mechanisms are included for interfacing Sun Common Lisp to C, Pascal and Fortran programs.

Sun Common Lisp can be licensed as a development environment or as a runtime applications environment. The development environment features a library of functions, special forms and macros to speed programming. It also offers an optimizing compiler and an interpreter. A set of tracing and debugging facilities is said to enhance productivity. The development environment reportedly enables construction of hybrid applications that use symbolic and numeric computation.

Sun Common Lisp costs $3,500 for license, tape and documentation. The applications environment will be available separately for $875. The product is scheduled for fourth-quarter availability.

Sun Microsystems is located at 2550 Garcia Ave., Mountain View, Calif. 94043

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TRAINING

■ **GMD Systems International, Inc. has announced an end-user training program for users of IBM's Mapics I or Mapics II business control system.**

The program, dubbed Mapics Unsupervised System Education Resource (User), is a series of multimedia instructional packages intended to improve user skills necessary for using the display stations for data entry. The program trains users to obtain various reports and inquiries produced by the Mapics system.

The first User modules covering product data management, inventory management, costing and production control and costing are available now. Each Mapics User module is priced at $1,295.

GMD Systems International, Suite 420, 8601 Dunwoody Place, Atlanta, Ga. 30338.

■ **Control Data Corp. has announced the Ada Programming Series, a 90-hour Plato computer-based training curriculum for training programmers in the higher order Ada language. The Ada Programming Series runs on CDC's Plato Personal Training Station and on other IBM Personal Computer-compatible systems.**

The series includes three courses: Ada Programming: Fundamentals, Ada Programming: Advanced Features and Ada Programming: Soft-

Continued on page 74

From page 61

Users like PC Link, not price

tem (DBMS) shop, the firm evaluated Software AG's Natural Connection micro-mainframe link late last year, Erb said. He added the feeling was the Software AG link was not ready, so his firm went to M&D's PC Link.

Forest Oil now has five PC Link packages installed for budgeting applications. The micros link IBM Personal Computers to an IBM 4341 Group 2 mainframe running MVS. Instead of downloading production data into spreadsheets, the company downloads data to an Ashton-Tate Dbase III DBMS on the Personal Computer, Erb said. Users in several division centers with Personal Computers with PC Link prepare budgets and send them to corporate headquarters, where they are merged into a single budget, Erb said.

M&D's Conrad indicated that PC Link's price may be cut. "If anything, it will go down. I don't see the price on the micro side going up," he said. He said price was not an issue on the mainframe side.

User Bruce Pergament, vice-president of administration for Pergament Home Centers, a retail chain of 40 stores based in Melville, N.Y., said the PC Link price may be justified by the product's development costs. "It's not easy to say the product is too expensive," he said.

Pergament said his firm, which is privately held with revenue of more than $100 million annually, decided to buy PC Link when it bought M&D's general ledger accounting package nine months ago.

"We felt it was a necessary adjunct to the [general ledger]. We felt any [general ledger] we bought today needed a link. We feel we can do all our budgeting with two or three people," on IBM Personal Computers with PC Link connected to the company's IBM 4381 mainframe, he said.

Downloading to 1-2-3 attractive

PC Link's ability to download data to a Lotus Development Corp. 1-2-3 spreadsheet also attracted Pergament to the package. "Instead of forcing you to go into some type of micro package you don't want, M&D made a commitment to go to Lotus, which has become the industry standard. Many 1-2-3 users don't want to take the time to learn another package. They don't need anything else," he said.

Pergament has three PC Links installed now and has plans for more. The budgeting application is being worked out. The most time-consuming task is defining mainframe production data into fields, files and lengths appropriate for use on the Personal Computers. "If you try to download too much data, you send your [Personal Computer] into a coma," Pergament commented.

Training users on PC Link, especially users unfamiliar with M&D's Millennium on-line applications development system, also takes time. "Users have to make an effort to learn the intricacies of this package," Pergament said.

An Albuquerque, N.M., bank plans to use PC Link to connect executives on a local-area network to production data, said Jerry Smith, senior systems analyst at the Albuquerque Federal Savings and Loan. Like the other users, the bank is currently using the link to help prepare budgets. Four link packages have been installed, the first in early 1984.

A total of 25 subsidiary companies submit their budgets to Smith's group, which is linked to an IBM 4381 mainframe running MVS. The analysts work on the budgets in 1-2-3 then send them back up to the mainframe, Smith said.

The bank's latest PC Link project is to link the executives in a 10-node network, five in one building on a local-area network and five in another building on dial-in lines. "The thrust is to get information off the mainframe and into management's hands, to be available at any time with very little impact on data processing," Smith said.

The managers, including the company president, will access a version of the data base to be updated weekly, he said. For the executives' purposes of planning and evaluating how efficiently the company is operating, a once-a-week update is sufficient, Smith said.

For updated versions of PC Link, Smith said he hopes M&D will offer users a way to share templates they have prepared for use with 1-2-3. An M&D spokesman said the PC Link development effort is aimed at linking the IBM Personal Computer to minicomputers, and then linking the minicomputers to a mainframe.

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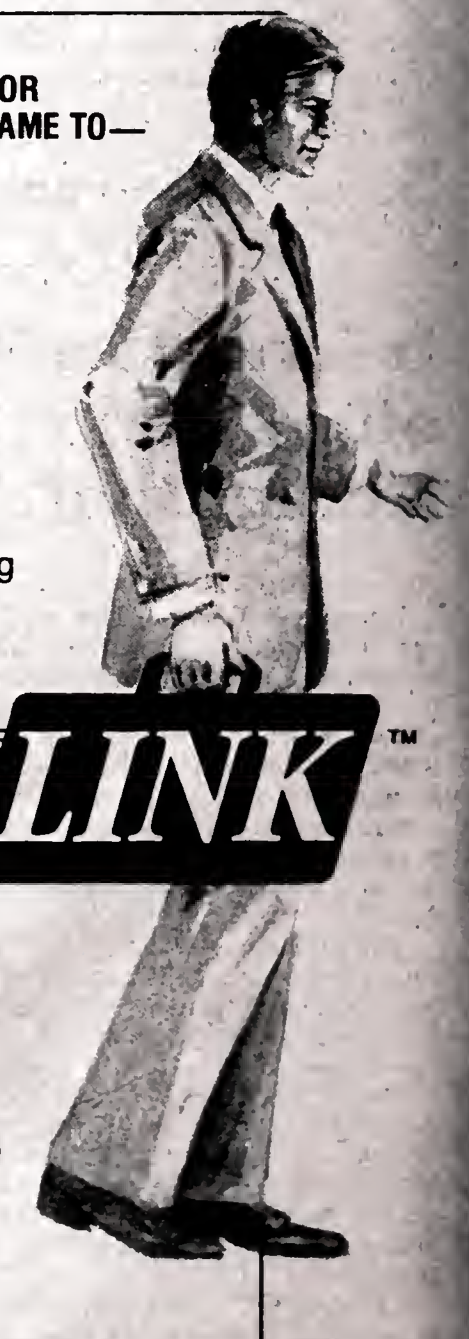

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Continued from page 70

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CDC, Corporate Telemarketing, Mail Station MNB04A, P.O. Box 0, Minneapolis, Minn. 55440.

■ **Alsys, Inc. announced that its Lessons on Ada computer-aided instructional course now runs on Digital Equipment Corp.'s VAX computer systems running Version 4 or higher of the VMS operating system.**

The instruction package was previously available on the IBM Personal Computer and compatible machines, according to Alsys.

Lessons on Ada for the VAX requires a DEC VT241 color monitor.

Lessons on Ada for the VAX is priced from $6,000 for the Microvax to $15,000 for the VAX 8600.

Alsys, 1432 Main St., Waltham, Mass. 02154.

From page 61

M&D link eases reporting

age. We didn't have that kind of money." The micro-mainframe selection was budgeted at less than $30,000.

The two-month search for a solution to Orion's problem began in October, and soon the list of potential products was reduced to six. Price comparisons and vendor visits helped Stein narrow his selection.

He also considered the company's ultimate objective to allow remote users in four divisions to access mainframe data for their own spreadsheet analysis.

Recommendation made

In January, Stein presented management with a 14-page report comparing micro-mainframe products and recommending McCormack & Dodge Corp.'s Interactive PC Link.

The product allows microcomputer users to transfer portions of foreign files into a variety of spreadsheets, including 1-2-3.

But his job was not complete. Now Stein had to convince both users and management that the product could be supported.

Emphasis on training

"One of the main reasons we got the product was not because it was clearly better," he said. "But it was the fact that we had a lot of assurance from the company that they were going to support us in everything we wanted to do." According to Stein, "I didn't want one product that we thought was outstanding because training wasn't a big issue to the vendor. In a start-up information center environment, training is a big thing in my book."

PC Link was more expensive than some of its competitors, Stein admitted. "I had a little explaining to do with management, but I pushed the training issue." Orion's workers needed a structured classroom environment. "I feel the best training anybody can give is in a classroom, where people can ask questions. You don't get that out of a demo disk." And, he added, "Management doesn't want something that costs $20,000 that no one will use."

The micro-mainframe link was not always a welcomed solution at Orion, according to Stein. "There was a lot of negativism," both from management and users, he said. Orion overcame some installation problems, with the help of M&D service technicians, he said.

"Everybody thought they could install it themselves," Stein noted. "The financial group thought they could do it, and the technical support people thought they could do it. We needed the help of the vendor."

For the analysts in Orion's financial group, PC Link has meant that less time is spent generating financial reports. Before installing the product, two workers spent two weeks each month generating financial reports, according to Richard Tardif, vice-president of financial information. "A lot of people were keypunch operators," Tardif said. "I look at this as a great tool to get us out of the manual sweat work."

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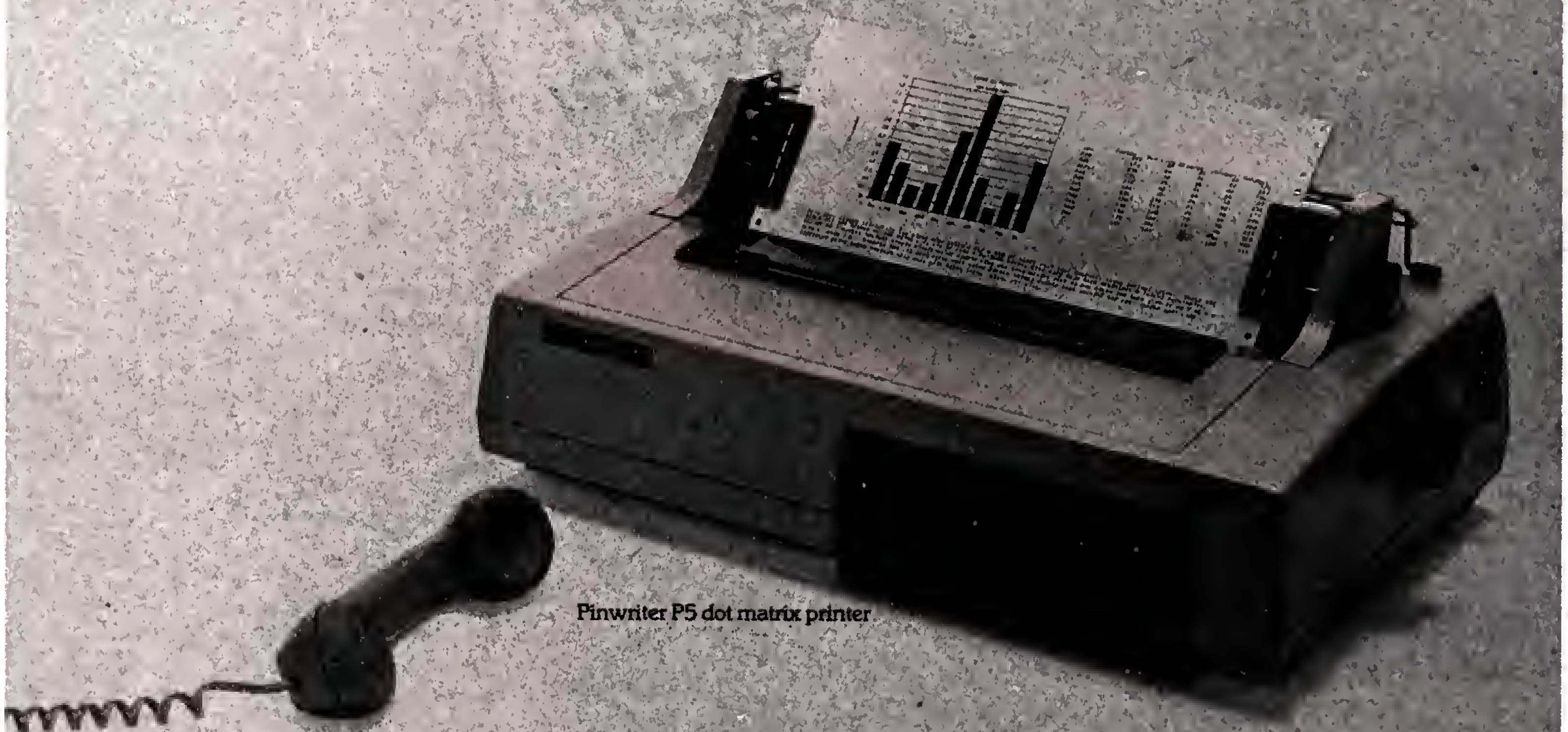

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September 30

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Are you rushing too fast to subsecond response time?

Can subsecond response time increase programmer productivity in your systems department? Is it worth the investment? Corporate managers must understand the research upon which claims are based before answering these questions.

By H. Thaine Lyman,
James Anderson
and Jeffrey Plewa

Are MIS managers expecting a magical increase in programmer productivity in return for their investment in subsecond system response time? We think the answer is yes. Unfortunately, these expectations are not supported by the research done to date.

Several articles published in the past decade describe how reducing the response time of interactive systems can dramatically improve the productivity of programmers doing systems development work. Arvind Thadhani of IBM pioneered this area and published two articles documenting his findings. An IBM marketing pamphlet, "The Economic Value of Rapid Response Time," describes experiments at IBM's Systems Products Division and the

company's program development facility at Portsmouth, England. The experiments purport to show significant productivity increases from improving response time. The pamphlet projects savings of up to $300,000 per month for a hypothetical 100-programmer group that reduces response time from 3 seconds to 0.3 seconds.

In systems departments, emphasis has shifted from evaluating and trying to confirm the claims made for subsecond response time toward implementing it to achieve the benefits — as though the question of benefits is settled. Many MIS managers have either adopted subsecond response time or are justifying it to top management.

One company has published an internal subsecond response time standard as an inducement for new programmer recruits to join up. Another has proposed a hardware expenditure in excess of $150,000 per month to secure the productivity increases expected from subsecond response time. These activities are taking place even though published research cautions against a simplistic application of findings and underscores the need for further applied study.

> ”
>
> *Many organizations would have to double the resources available to development in order to achieve the subsecond response goal.*

The stakes are high. As reported in the 1984 *Statistical Abstract of the United States*, there are nearly one million computer professionals now employed in the U.S. If as many as one-third of that number regularly engage in on-line programming, the impact of subsecond response time could mean billions of dollars annually in improved productivity. The costs of subsecond response time are similarly high: Many organizations would have to double the resources available to program development in order to achieve the subsecond response goal.

The impact of any systems productivity improvement will be visible. Firms in all industries increasingly depend upon computers for survival in markets where information and instantaneous service are crucial. Organizations' demand for computing is growing at an estimated 40% to 60% compound annual rate.

But the backlog for systems development projects is growing faster. One recent study found that the average waiting time for a project to be delivered has grown to more than two years from only 1.5 years in 1981.

Systems development managers are in the vanguard of those proclaiming the benefits of subsecond response time as a way to leverage their staff resources to greater throughput, shorter project times and smaller budgets.

Can subsecond response time increase programmer productivity in a systems department? Is it worth the investment? Corporate managers must understand the research upon which claims are based before the answers to these questions can be known.

The research

Thadhani's first experiment began as an unstructured exploration into the effects of system response time on computer user behavior. No experiment design or objective was stated in the article discussing his results. He studied two MVS/TSO environments passively. (No changes were introduced

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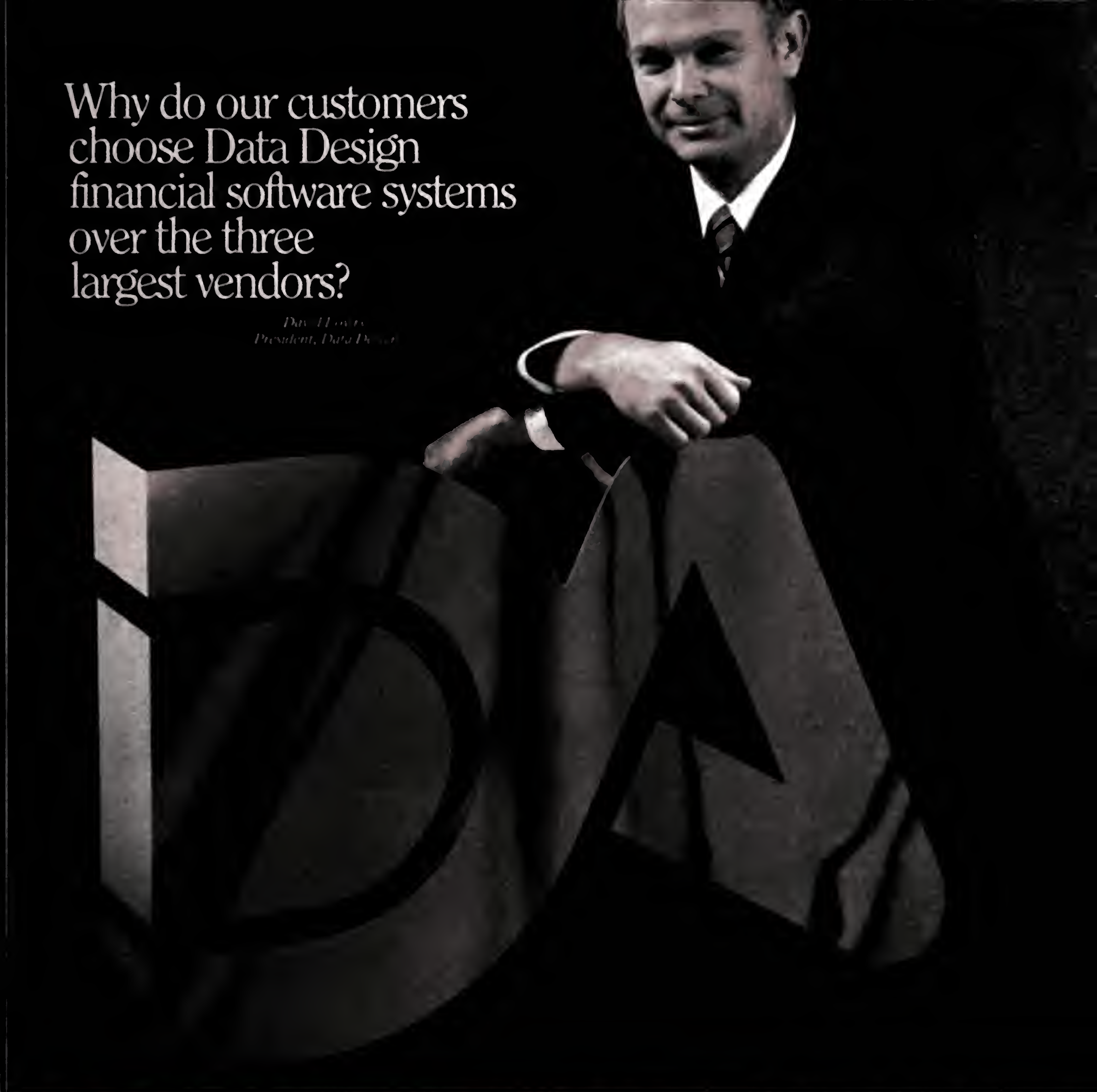
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into either environment by the experiment).

Thadhani finds that the number of transactions initiated by users increased by more than could be accounted for solely by the additional time available from quicker transactions. He concludes that this finding was caused by a decrease in user "think time" per transaction.

He reasons that if users complete the think time necessary before the next transaction in fewer seconds, they must be thinking more efficiently. This phenomenon was attributed to the slower decay of the "short-term mental memory buffer" mentioned in an earlier article. Productivity was assumed to increase based upon these results.

Thadhani, in a later article, also describes another effort to show the salutary effects of "good computer services." A project team was given subsecond response time, their own terminals, a private room (necessarily close to the machine room because subsecond response time was achieved through local connection of terminals), 15-minute test job turnaround time and high availability on the computer dedicated to program development and testing.

No attempt was made to isolate these variables. The author assumes that it was not possible to conduct a controlled experiment in which subsecond response time was the only variable.

Thadhani draws no quantitative conclusions regarding the effect of subsecond response time on programmer productivity. A summary finding of improved project productivity was reached: "These achieved productivity rates are significantly higher than those achieved on similar projects within IBM."

Productivity improvement

G.N. Lambert, writing in the *IBM Systems Journal* in 1984, reports on an experiment conducted in 1983. A group of systems developers was given an isolated project room, their own terminals and subsecond response time.

Based upon a measure of function points estimated to be involved in a project and "highly reliable" estimates of what the project would have required had it been undertaken with normal systems service, users with subsecond response time demonstrated substantially greater productivity than their counterparts with normal service.

Function points measure the complexity of a programmer's task. Point values are assigned to the program based upon the number of generic tasks the program performs, such as number of I/O files and number of computations. This method allows the work necessary to produce different kinds of programs (such as on-line vs. batch) to be compared on an equal basis.

Lambert documents a 58% improvement in productivity as well as a probable improvement in project quality (measured in number of trouble reports). The improvement in quality is attributed to what could be called a "synergistic effect" of subsecond response time and environmental factors. Programmers in the experimental group also provided highly positive feedback in subjective interviews after the study. Lambert states that the IBM unit where the project was conducted has since decided to install subsecond response time combined with private team project rooms in other program development centers.

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> *In systems departments, emphasis has shifted from evaluating and trying to confirm the claims made for subsecond response time toward implementing it to achieve the benefits — as though the question of benefits is settled.*

The IBM marketing pamphlet mentioned earlier summarizes a study of engineers performing card-wiring tasks using graphics display terminals. The work of 15 engineers of varying levels of expertise from four laboratories was measured. Although no comparisons were made between card wiring and systems development, productivity of the engineers, measured by number of transactions per hour and total time required to complete a wiring task, went up dramatically.

Lawrence Kosmatka, in a 1984 *Computerworld* article, describes efforts to duplicate Thadhani's results. His company installed subsecond response time attempting to achieve the published benefits. At various stages of enhancements, Thadhani's results were duplicated. At the end of the project, however, the systems development manager saw no substantive improvements in project completion times or budgets.

Kosmatka delved further into his data and discovered evidence of a "statistical illusion," which he suspected might be present in the previously published research.

Kosmatka finds that users modified their behavior or usage patterns of transactions as response time improved. While causality between the observed behaviors and subsecond response time is not proven, a substantial correlation is evident. Given subsecond response time, users significantly increased the percentage

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> *Conclusions about productivity enhancers in the DP professional's environment need to be correlated with the tools, work patterns and activities of the future rather than the editing-oriented coding of the past.*

of one-character transactions they executed.

He also finds that as system response time improved, reaction time sped up. Although Kosmatka does not generalize about the observations, one could conclude from his results that subsecond response time causes users to think less and press the Enter key more — a quite different conclusion from that drawn from the other articles.

Kosmatka concludes that Thadhani's "think time" improvement is an illusion; in fact, user think time appeared statistically unrelated to subsecond response time in Kosmatka's data.

Furthermore, Kosmatka finds that reaction time actually improves as system response time improves, resulting in real productivity saving (although much smaller saving than is attributed to "think time" improvement in earlier research) of "several tenths of a second." This particular finding is most pertinent to users of systems in which reaction time is a key component.

The IBM engineer card-wiring environment might be such a system with its higher routine content; a comparison of its results with Kosmatka's supports a conclusion that subsecond response time is most beneficial in a routine, production-oriented environment.

A study of the impact of response time on data entry performance by T.W. Butler further supports the conclusion that improvement in system response time has a more direct benefit in routine systems applications than in more general or "cognitive" situations such as applications development.

In an experiment conducted at Bell Laboratories, Butler found that there is a relationship between average system response time and user performance rather than between the most recent system response time and performance, contradicting the premise of short-term memory decay proposed by Doherty and Kelisk.

The authors of the published research all caution against a naive application of their results, citing the need for improvements in experiment design and measurement of the impact of subsecond response time. Managers should heed these cautions and understand the weak points in the research before applying subsecond response time in their own installations.

Problems with the research

Existing published research on the benefits of subsecond response time has several weaknesses. These weaknesses are especially important in light of the magnitude of the investments in productivity enhancement that data processing executives are being asked to make. Six major weaknesses exist in many of the studies and in documentation published to date:

- Mixed experimental factors
- Overemphasis on coding as the critical activity
- Ambiguity concerning the measurement of productivity
- Questionable methods of data aggregation
- Oversummarization of statistical results
- Omission of relevant variables.

Perhaps the most serious problem with many of the experimental results is the obvious mixing of variable factors controllable in the environment. In several studies, subjects were given not only subsecond response time but also a new, quieter work area, a team workroom and private desk terminals. Productivity improvements were measured, but were they caused by subsecond response time, the quiet workroom, private terminals or some other variable?

In this situation, perhaps nothing more exotic than the "Hawthorne effect" may have led to many of the observed improvements. This effect describes an artificial change in employee productivity or attitudes because the employees sense the company is paying more attention to them or is trying something novel.

Coding activity has been a central focus of much of the published research, yet coding seems to be a shrinking part of the DP professional's workload, while use of efficiency tools such as application generators and "programmer tool-kits" is on the rise. Such tools permit significant work to be accomplished with only a few commands or terminal transactions at a cost of higher per-transaction resource requirements.

The published research does not give insight into whether productivity benefits vary depending upon the use of such "advanced application development" tools. Conclusions about productivity enhancers in the DP professional's environment need to be correlated with the tools, work patterns and activities of the future rather than the editing-oriented coding activities of the past.

Methods of measuring productivity vary among the different research efforts. We favor the function point approach. Measurements that focus

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on keystrokes, transactions or other work-oriented variables have less credibility as productivity measures than as results-oriented function point measures.

Methods standardization

Different statistical methods are used in each study to boil down the large volume of data collected; that is, to eliminate inappropriate or suspect data and aggregate the remaining data into summary observations. These methods should be standardized for purposes of comparison.

Many adjustments to correct for bias in the raw data are not well supported. Looking at the "before and after" picture of a whole group of users for major periods of the day is only one possible approach to data aggregation. Use of a different technique — such as looking at individual users' productivity changes — might be more relevant.

We favor a measurement approach that focuses on each programmer's productivity before and after subsecond response time. Two groups of programmers — one control and one experimental — would be compared using an approach measuring before and after results for each programmer rather than the sum of all programmer productivity.

It is also important to measure all the relevant variables that describe the type of work being performed on any given terminal session. Kosmatka's data, showing the number of one-key transactions and how it changes with the implementation of subsecond response time, vividly demonstrates how measuring related variables can add a new perspective to experimental data.

People are quite different in their use of the terminal as a productivity aid. These differences are in "style," degree of preparation, use of sophisticated features or labor-saving techniques and so forth. Experiments must take such differences into account to be relevant to management's decision to invest or not invest in subsecond response time resources.

The published research has unquestionably pioneered our knowledge and understanding of the environment of the interactive terminal and its impact on productivity. Future inquiries should build on, not discard, what has been done. However, experimental results must be recognized to have been generalized prematurely to support computer purchase decisions.

Alternative enhancers

The discussion above is meant to refocus research activity on obtaining the most relevant insights possible into the complex world of systems development. It also should serve as a warning to managers that great care must be taken in applying published results to their own departments. We believe that systems managers should evaluate a variety of cost-effective strategies discussed below to increase systems development productivity.

Though per-unit hardware costs are declining, the implementation of subsecond response time is still very expensive. Personal costs are consuming an ever-growing share of the DP budget. Effective utilization of personnel is fundamental to planning and management in a well-run MIS department. Before spending huge amounts on hardware improvement, it is advisable to investigate alternative ways of improving productivity.

Programmers view the computer as a tool. Their satisfaction with this tool may affect programming productivity. The major factors that determine satisfaction with computer service are subjective and include the following:

- Reliability — The system must not go down in the middle of a complicated online debugging session.
- Availability — The system must be available according to a posted schedule (not necessarily around the clock).
- Timeliness — The system response must be, at minimum, as fast as the programmer expects it to be.
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We believe that the key is to manage the expectations of the programming staff and to meet those expectations. Where system repsonse time is concerned, is it not possible that the critical component in the measurement of programmer satisfaction is reliability of system response time rather than its sheer speed?

The programmer who consistently receives 1.5 second response time will, with all else equal, be more satisfied than the programmer whose system response time varies between 0.25 and 1.5 seconds. This view is based upon our observation that perceptions about response time may have more impact on programmer satisfaction than does numerical data. We have seen departments where programmer perceptions about system response time (in other words, it's "getting worse") are opposite of measured reality.

Environmental effects

There are numerous books, articles and papers devoted to productivity in the work environment. Researchers studying various settings have identified environmental factors that can affect productivity, such as lighting, room temperature, size of work space and proximity to other workers. Other studies have shown a link between productivity and the color of walls, carpeting and cubicle partitions.

These findings should lead the MIS manager to investigate the physical work environment of the MIS staff. Noisy printers or hallway traffic make concentrating on complex programming problems difficult. Partitioned cubicles and team meeting rooms can enhance the problem-solving process.

Another option is a project team programming room. Here, the interaction among programmers can increase productivity because team members "share knowledge."

Every study reviewed in this article provided a terminal for every user. Many companies are concerned that hundreds of thousands of dollars per year are wasted by programmers wandering around their MIS departments looking for an available terminal.

A terminal on every desk

Putting a terminal on every desk may be a relatively low-cost way of increasing programmer productivity. A programmer with a test job waiting for execution in a queue is more likely to monitor it closely if he can glance up occasionally and see its progress.

A terminal gives the programmer the luxury of immediate access to all tools, manuals, program listings and specifications required in the normal programming cycle. Programmers can work on documentation or research another problem while waiting for a job to finish execution. They know at once when the job is complete; they can review results, recompile the program if necessary and then resubmit the program for execution. Not having to walk back and forth between terminal and desk reduces the amount of time required to complete the programming task.

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> *We have seen many cases where simple before-and-after analyses are not done, where 'planned vs. actual' is not calculated and where 'this year compared to last year' is not understood. Such organizations know nothing of performance variance, much less the causes of the variance.*

The basic disciplines of project management may be even more fundamental to productivity than the physical environment. Failure to employ certain basic management practices can often severely hinder the productivity of systems development staff.

Some common pitfalls include poor communication, poor personnel development, vague project goals, poorly defined responsibilities, little or no project task level planning, poor follow-up on critical tasks and lack of professionalism. Good project management methods can be difficult to implement and measure; nonetheless, MIS managers cannot afford to ignore them as a means of enhancing productivity.

Establishing programming standards and verifying compliance can also contribute to more effective use of programming resources. The use of structured design and programming, walkthroughs and standardized documentation, for example, can produce dramatic benefits in programming productivity and quality.

An effective training program is crucial to implementing these ideas. An MIS department that is successful over the long term usually knows how to transfer management expertise and technical knowledge to less experienced staff. Such organizations recognize that systems professionals require formal training well beyond the entry level to lock in professional growth and transfer skills effectively.

Beyond the obvious personal benefit of acquiring skills, many programmers perceive their employer more favorably for having made the investment in their growth. A more dramatic short-term impact on productivity can be obtained by hiring

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Massive amounts of time, effort and capital have been expended on the development and use of fourth-generation, user-friendly programming languages. It is not clear that these languages are fine-tuned to the point where most programming requirements can be accomplished by end users without needing the assistance of trained systems professionals.

These languages, however, when used by non-MIS staff to develop low-volume or one-time programs, can increase development staff effectiveness by freeing them to work on more critical applications.

Motivation

Motivation is another factor affecting productivity. Herzberg developed the Motivation-Hygiene theory to explain employee satisfaction. Hygiene factors, which contribute to job dissatisfaction, involve company policy, supervision, work conditions and relationships with supervisors, peers and subordinates. Motivators, which contribute to job satisfaction, include achievement, recognition, the work itself, responsibility and growth.

Quite possibly, however, technical staff may be very different from other corporate personnel in the way they view their work.

A Columbia University study sponsored by *Business Week* magazine reports that "the innovative specialists who help companies develop and use their computer systems effectively often bring to their jobs different work standards, definition of status and criteria for success than those of most managers."

Technical people rated learning new skills, security, location and better hours as higher priorities than other corporate managers did. Technical people also rated such factors as responsibility, salary, autonomy and job title as less important than did other corporate managers.

A highly quantitative approach to assessing performance in all phases of systems development is a common denominator among successful development organizations.

In contrast, we have seen many cases where simple before-and-after analyses are not done, where "planned vs. actual" is not calculated and where "this year compared to last year" is not understood. Such organizations know nothing of performance variance, much less the causes of the variance.

It would be difficult at best to justify the installation of subsecond response time in an organization where systems development productivity was not measured precisely. Without measurement and the resultant detailed understanding of the performance, management cannot know the impact of its decisions.

In the absence of generally applicable data concerning the possible effects of implementing a subsecond response time program, a recommended course of action for an organization interested in increasing productivity is to conduct its own experiment.

Results, based on the organization's own personnel and environment, are far more credible and meaningful than external research results as that organization considers extending such facilities to all systems professionals.

The ideal experiment should use function point measurement as well as "control" and experimental groups and measure individual programmer productivity rather than group totals.

About the authors

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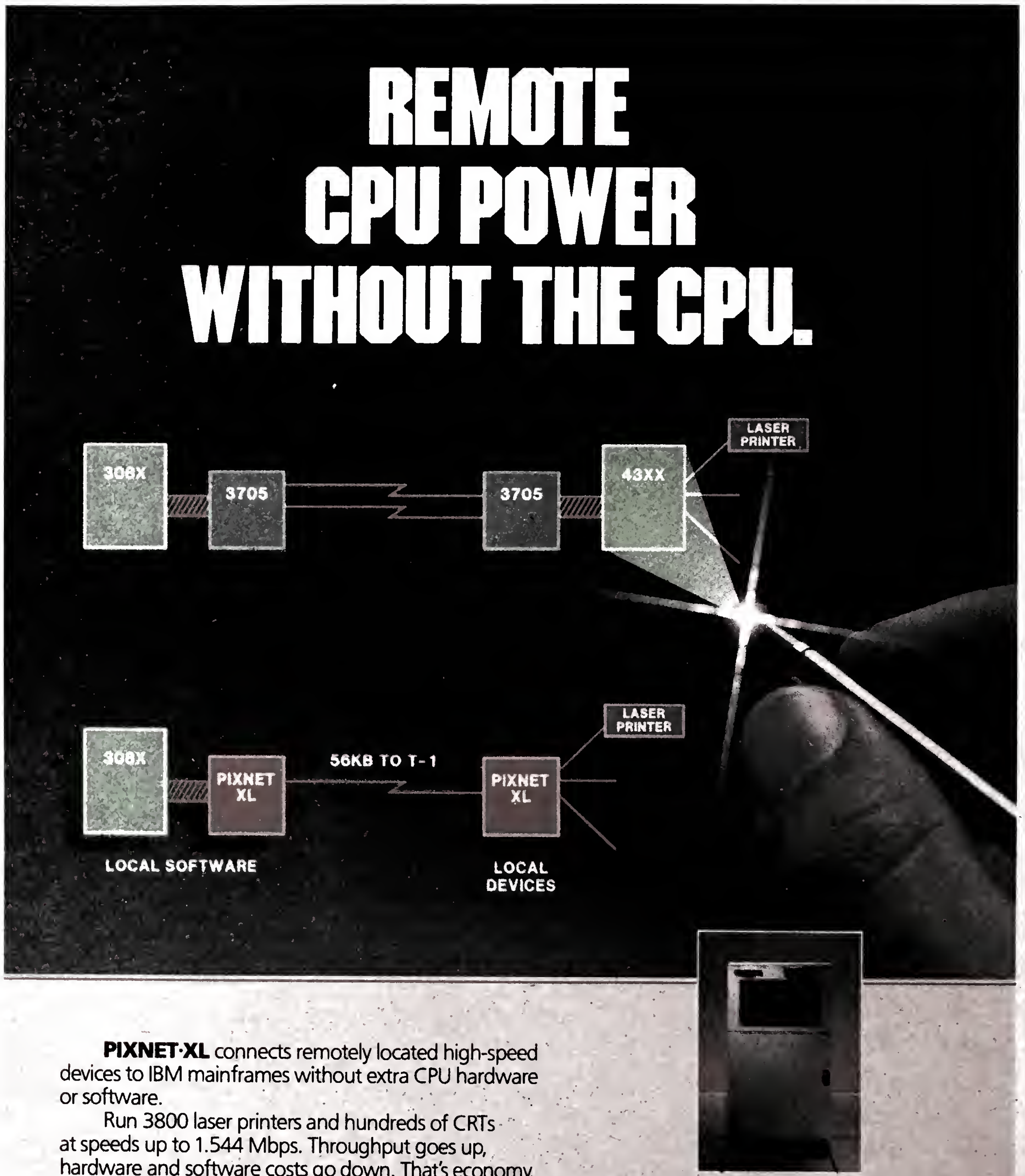

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THE NEXT WAVE OF USER DOCUMENTATION

The next era of documentation will begin not because someone invents a better way to show a book on a screen, but because someone will decide it is time for the technology to adapt to the user instead of the reverse.

By Edmond Weiss

The traditional user manual is already obsolete.

When I make this statement to technical writers, I quickly reassure them that in data processing, many people work at obsolete tasks for years. (Consider all those folks still writing payroll programs in Cobol.) Some technical writers will keep laboring in their vintage 1960 reference-manual style for quite a while yet.

At the leading edge of documentation, however, profound changes are afoot. Like any futurist, I search for the future among the brightest practitioners of the present. What I see today is a second wave of interest in user documentation.

The first wave began in the late 1970s, with the proliferation of microcomputers into unaccustomed settings. The question then was, "How can we write manuals that users can understand?"

The second wave began more recently, probably impelled by the drop in the cost of memory. The question now is, "Why must productive use of technology depend on cumbersome documents or on any documents at all?"

In the early 1970s, when DP professionals were more worried about applications backlogs than the proliferation of user-written applications, documentation was little more than an administrative convenience. Before the advent of micros, the user or operator of a computer was likely to be a well-trained engineer, programmer or technician.

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> *The typical manual users are not the willing victims that their ancestors were. In part, the typical users are no longer technically educated and many not educated at all; although they are literate, they hardly ever read.*

The users of yore expected their technical publications to be murky and difficult. Indeed, an inpenetrable manual was the cachet of the programmer's job, the emblem of technical challenge. Similarly, if the manuals failed because they were inaccurate, incomplete or obsolete, these resourceful users could be expected to immerse themselves in their undocumented problems and persist until the machine yielded its mysteries.

All that has changed with the personal computer. When the typical operator/user of a system is a business professional who won't waste time on inaccurate and indecipherable junk or an office worker who is proficient in administrative skills but a novice on a micro, the documentation must change.

Gradually, the developers of systems and products have become aware of a trade-off. They saw that good documentation saves money: Having good manuals costs less than not having them. Every incompleteness, every error, every unclear or obsolete instruction has its price. And that price almost always involves personal services: training, consulting, telephone hot lines, field visits or late-night trips to the operations center.

So, as the 1970s ended, there was a flourish of manual writing, including run books, which told operators what procedures to follow and lookup books full of definitions, policies and arguments. Written by people who learned their trade in the military and used a style that evolved during World War II, these user manuals were classics. They were definitive, comprehensive and yet compact. One or two large books would fit every user's needs. Anyone resourceful enough to explore the text would surely be rewarded.

Of course, some organizations still have not reached even this elementary level. There are still complicated systems without much user documentation. Sometimes this situation occurs because the user and operators are of that older ilk — uncomplaining and resourceful, able to get by with slim or incomplete manuals or with no manuals at all. More likely, though, this situation comes about because the costs of the personal services are not accounted for.

Some companies (and apparently many government agencies) are still unable to assess the cost of work performed by salaried employees. They act as though work done by the staff is free — as if the cost of the hot line is the cost of the telephone bill, not the people who staff it.

Almost as bad is the notion that the only costs that matter are those incurred in one's department. One manager told me that he saw no reason to lower the training expense by increasing his documentation expense because the training budget was someone else's department. In a perversely similar vein, another manager told me not to make the manuals too clear because the company sells its training to the customers to make an additional profit.

For most organizations, though, the 1970s brought the realization that systems without user manuals are wasteful. In response, the classic, one-size-fits-all technical tomes have been made available by most of the large vendors and better developers.

Resisting tradition

However, by the 1980s this classical orientation was proving unpopular and unworkable. Traditional manuals seem slow and cumbersome to people working on-line. Indeed, many workstations have no room for an open book much less two, as some vendors suggest.

In the '70s, users wanted manuals. In the early '80s, manual writers complain that users don't read the manuals they have. In part, this situation occurs because the typical 1980 manual is unsuitable for and inaccessible to any readers who value their time. Typical manual users are not the willing victims that their ancestors were. In part, the typical users are no longer technically educated, and many not educated at all;

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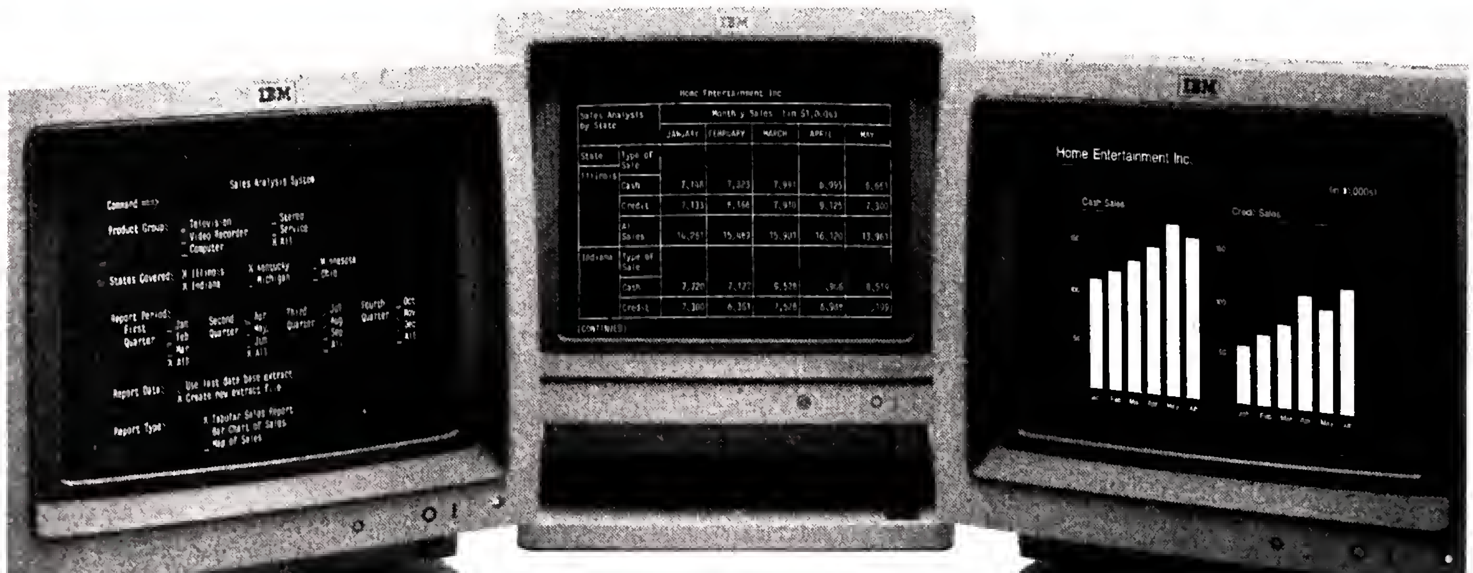

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although they are literate, they hardly ever read.

Considered another way, though, the modern users' resistance to traditional manuals is understandable. Reading a set of instructions from a book makes little sense when the instructions could just as well be read on the screen of the system being used. With the possible exception of the installation procedure, all the information for users can be communicated through the system.

In the '80s, then, the issue is less information products (manuals) vs. personal services. Rather, the question becomes what mix of information products best serves a user community with its diverse needs and abilities. So we see the a small library of manuals, geared to these needs: comprehensive reference works; "friendly" orientation manuals; and quick reference brochures.

If there is a conflict, it is between books and "nonbooks." Today, many who market systems or manage data processing believe that manuals should be on-line or on audio tape or videodisk. In some cases, this preference is merely stylistic. In many cases, however, it reflects the understanding that printed manuals are often the least effective way to support systems and software.

> ”
>
> *The enlightened view is that user manuals are part of a library of documents that are part of a library of book and nonbook information that is part of a set of goods and services that support the user.*

Putting manuals into a data base (as opposed to merely shipping them on diskettes, another common practice) is more than a gimmick. Reducing the need for operators or users to leave their work in search of a printed table is simply good procedure. Jumping from screen to book to reference card to screen to book again irritates and inconveniences the user. More importantly, it causes errors and lowers productivity.

The people who benefit most from on-line user documentation are those with limited book skills; not limited reading skills — book skills. A large number of the people who are presumed to be poor readers are really only poor finders. Their problem is less with sentences and paragraphs than with indexes. If they could find what they need, they could read and understand it.

For these readers, the alternatives are either carefully written books that remove all extraneous and distracting material or on-line documents that find the material without much work by the reader.

In this second category, the two most prominent examples are the interactive tutorial and the context-sensitive Help screen. The former is an on-line realization of that most powerful of teaching tools, the branching programmed text, in which you must give the right answer before you may see the next increment of instruction.

Interactive tutorials give all the benefits of programmed texts without their central problem: the need to skip, branch, loop and detour. In a well-made tutorial (built with computer-based training (CBT), or "authoring," tools), the reader cannot misunderstand and, more importantly, cannot get lost.

Context-sensitive help is a utility in which the user asks for help (typically with one key), and the system finds the page in the manual that the user needs to see. Interestingly, the text files that underlie the Help facility are probably the classic user manual, indexed and partitioned so that each section corresponds to a particular task. And the next stage, no doubt, will give us "anticipatory" help, in which the system observes that the operator is having trouble (delays, errors and so on) and offers help before it is requested.

Moreover, getting documenters to write for the screen imposes a useful discipline on them. On-line documents must be organized into small, compact chunks; as hard as it is to use two pages at once in a manual, it is that much harder to see two pages at once on a screen. (Windows do little to solve this problem, but there are some emerging display devices that promise to show us several full-sized screens at once.) And the limited number of characters on the screen exacts an economy of expression that demands more editing than usual. That's why the most common flaw in on-line messages is that they are too compressed to be understood. The second most common flaw is the lack of procedural diagrams.

Support

What matters most now is support — the merging of documentation, quality control, training, implementation and customer service into one enterprise. The enlightened view is that user manuals are part of a library of documents that are part of a library of book and nonbook information products that are part of a set of goods and services that support the user.

Personal services involve little start-up cost. But they persist forever and usually increase as the number of users grows. Further, contrary to what many people expect, the better users get with their systems, the more support they want.

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that are often the unintended consequence of inadequate documentation may also be viewed as a deliberate support strategy. Enlightened documenters may choose between goods and services, between books and nonbooks.

> ”
>
> *The latest issue in user documentation is a skepticism about the notion of support itself. The first step was to provide information; the second was to give support; the third is to ask why all this support is necessary.*

One firm can aspire to "customer independence" through an ambitious set of books, disks and tapes, while another brags about its personal service and unlimited consulting. One organization can seek to create manuals that will clearly solve any problems an operator might have; another might skip the manuals and add more supervisors.

Trade-offs between goods and services and between books and nonbooks often reduce themselves to the issue of short-term vs. long-term support costs. Good manuals, adapted for their users, are expensive to write, but they justify themselves later in productivity, good will and the reduced need for personal services.

The latest issue in user documentation — a harbinger of things to come — is a skepticism about the notion of support itself. The first step was to provide information; the second was to give support; the third is to ask why all this support is necessary.

Support, it turns out, is a euphemism for helping users adapt to the difficult aspects of their systems. Although terms such as "user interface" suggest that users merely plug themselves into the system, in fact, such ease is hardly the case.

Support is the name for all the activities that bridge the gap between the wishes and abilities of the user on the one hand and the capabilities and dispositions of the system on the other. Support compensates, underpins, retrofits, translates, spackles, patches and reinforces.

In a way, support gives prostheses that help the users overcome their handicaps. And the better we get at support technology, the more useful and ingenious the appliances we invent.

The next wave

Support is what helps the users adapt to the system, not vice versa. In effect, technical writers explain the ways of machine to man, not the other way around. Training programs teach users to act the way the machines want them to act, not the reverse. It is this principle that inspires the next wave of documentation.

If the user is viewed as one of the components in a system, then the very need for support may be viewed as evidence of a bad interface among the components. There is a bad fit between users and hardware — as, for example, when there is no way to tell whether a toggle switch is on or off. Or there is a bad fit between users and software — as when the same program uses different Enter keys at different times or when a commonly used word processing command requires what pianists call an "octave spread" between one's fingers.

What nearly every manual writer discovers early on is that clean, clear procedures need less written explanation than complicated, clumsy ones. Similarly, a procedure or concept that resists explanation probably resists proper use.

What the latest teams of documenters also realize is that this clumsiness that seems to cry out for heroic manual writing is much more than the inevitable consequence of advancing technology: It is evidence of poor engineering. Specifically, it means that the system or product is unreliable.

Reliability will be in the late 1980s what maintainability became in the late

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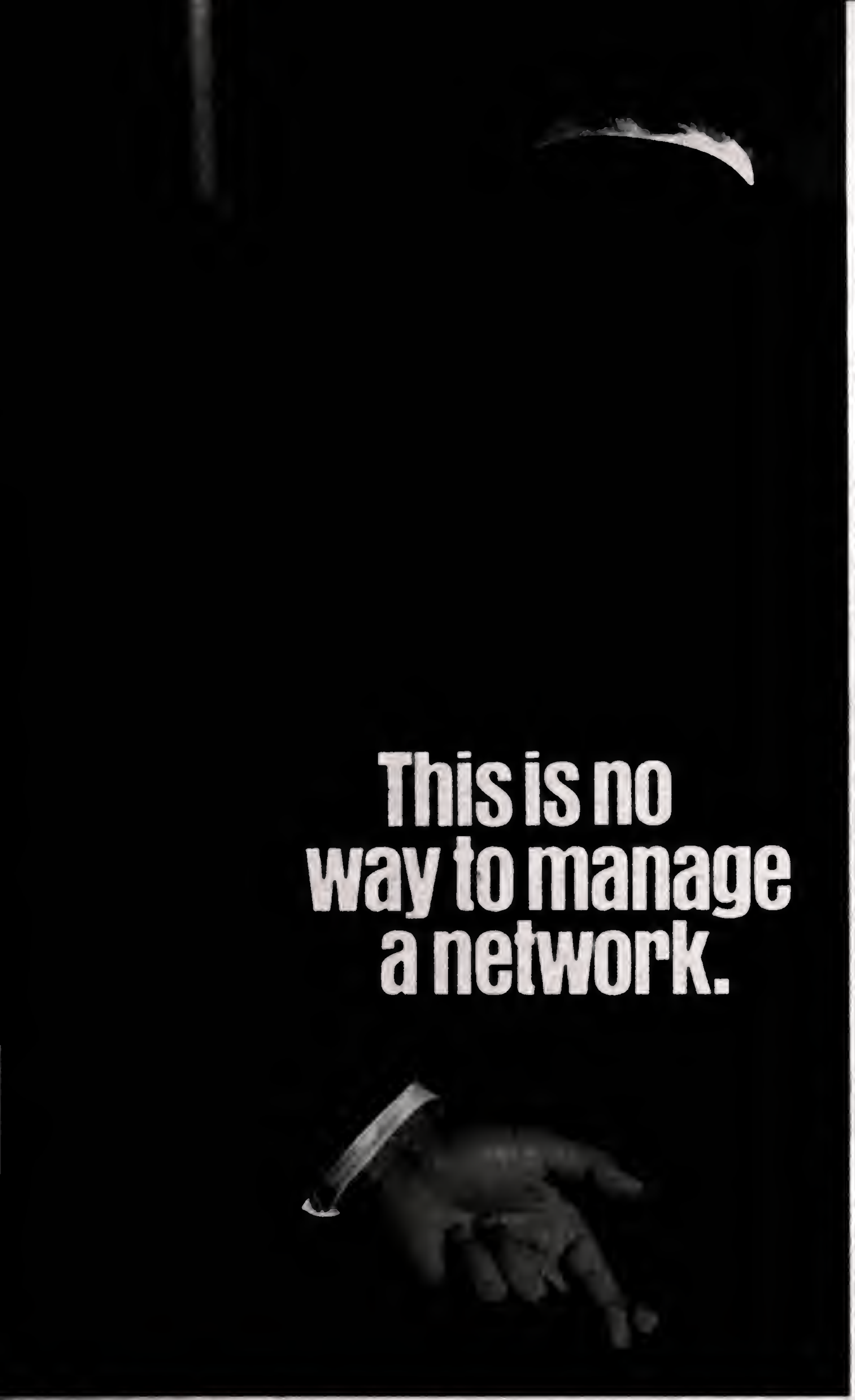
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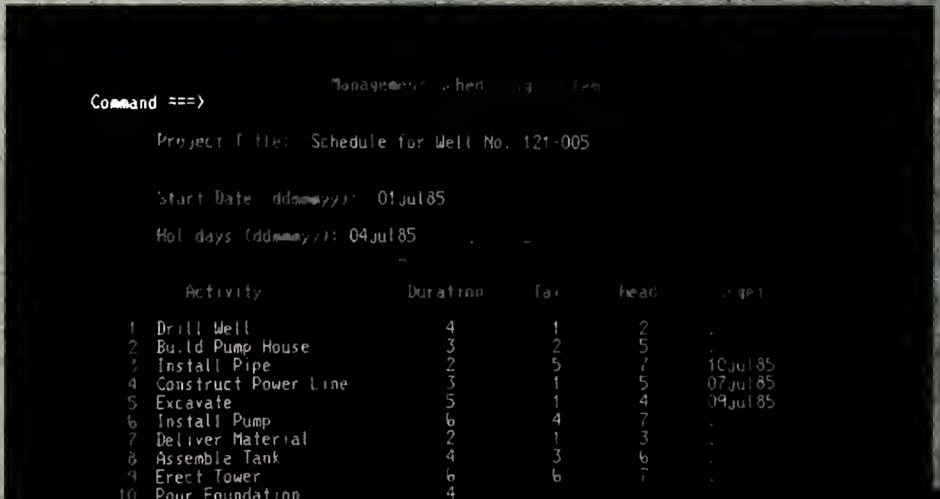

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                         Management Scheduling System
Command ===>

     Project Title:  Schedule for Well No. 121-005

     Start Date (ddmmmyy):  01jul85

     Hol days (ddmmmyy): 04jul85

       Activity                Duration    Tail     Head     Target

  1  Drill Well                    4         1        2        .
  2  Build Pump House              3         2        5        .
  3  Install Pipe                  2         5        7      10jul85
  4  Construct Power Line          3         1        5      07jul85
  5  Excavate                      5         1        4      09jul85
  6  Install Pump                  6         4        7        .
  7  Deliver Material              2         1        3        .
  8  Assemble Tank                 4         3        6        .
  9  Erect Tower                   6         6        7        .
 10  Pour Foundation               4
 11
 12
 13
 14
 15
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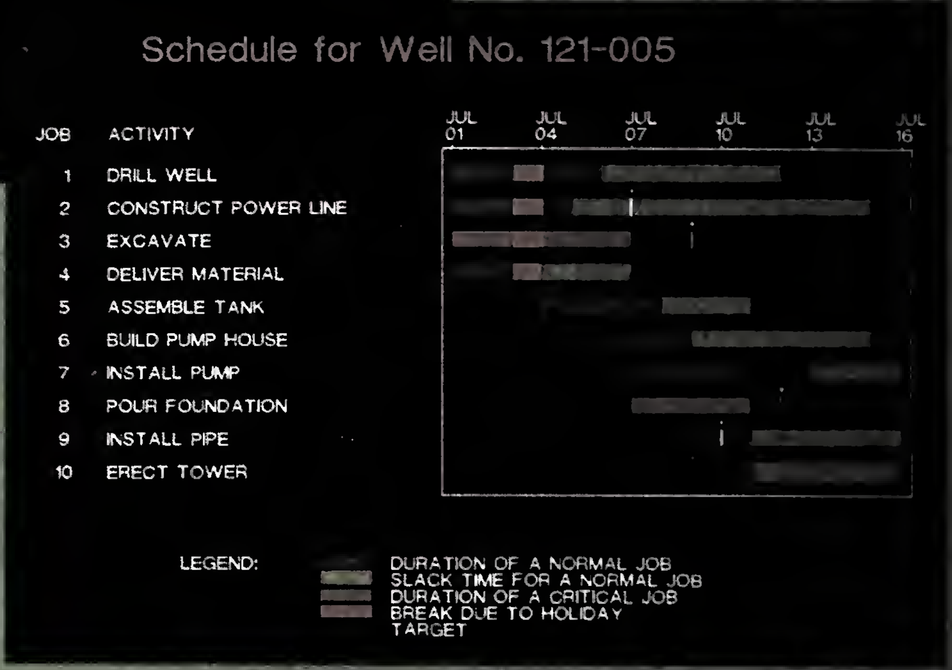

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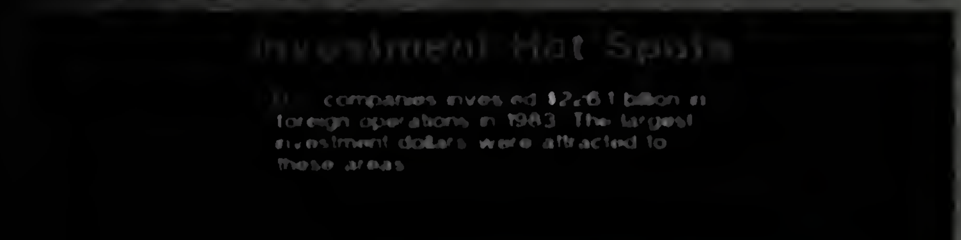

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1970s — the main criterion of system quality and cost-effectiveness. And the last frontier of computer system reliability will be the user, the least well understood or controlled element in the process.

Shift in support

Instead of developing ever more friendly manuals, the goal will be to shift the nature of support from external goods and services to internal design features. (Perhaps "internal support" is a contradiction in terms.) The reliability of the system in use will derive less from slick manuals than from the following factors:

■ Intelligibility — the ease with which prompts and messages can be read, understood and, where appropriate, obeyed.

■ Invisibility — the degree to which users are unaware of the system's tasks and peculiarities (what programmers misleadingly call "transparency," a word that means obviousness) and are free instead to think and communicate in their own terms.

■ Insight — the ability of the system to anitcipate what the user wants and interpret the user's "errors."

To an extent, putting reference material and procedures on-line is a rudimentary form of internal support. But a more dramatic move in this direction would be eliminating even the need for on-line pages.

From this perspective, preparing a readable booklet of error messages is the first step; putting this directory of error messages on-line is the next; making the error messages themselves intelligible is the next; eliminating the situation that caused error is the last.

In the fourth and fifth generation, then, documentation converges on design. Users stop asking how well-documented the system is and start questioning why the system needs so much documentation. Similarly, users may stop purchasing the products with the best support and service and instead choose the ones that do not require much support or service.

Writers as designers

When documenters are included on the design team, they tend to become designers. In the most advanced development groups, it is difficult to tell the writers from the programmers. Indeed, since today's technical writers work with computers using a variety of software tools, they can be considered programmers.

Those organizations that still want one-size-fits-all, comprehensive reference manuals should be looking for traditional technical writers, primarily those with backgrounds in aerospace or electronics. In those organizations with a variety of users and customers, especially places where the term "user-friendly" is uttered often, the best documenter might be thought of as a support engineer. This person is not only a skilled writer but also a skillful teacher and consultant.

> ”
>
> *Reliability will be, in the late 1980s, the main criterion of system quality. And the last frontier of computer system reliability will be the user, the least well understood or controlled element in the process.*

More importantly, the support engineer is someone who believes that the burden of effective communication and implementation is on the developer, not the user.

Support engineers

Support engineers can come from any background. Like the programmers of the early 1960s, support engineers didn't learn their trade in school. They are drawn by aptitude, opportunity, even passion. And their challenge is the most interesting assignment in all of data processing: to bridge the gap between developers and users, between engineering and sales.

Support engineers must possess superior writing and communications skills, no matter what they studied in school. Beyond that, they must be able to understand

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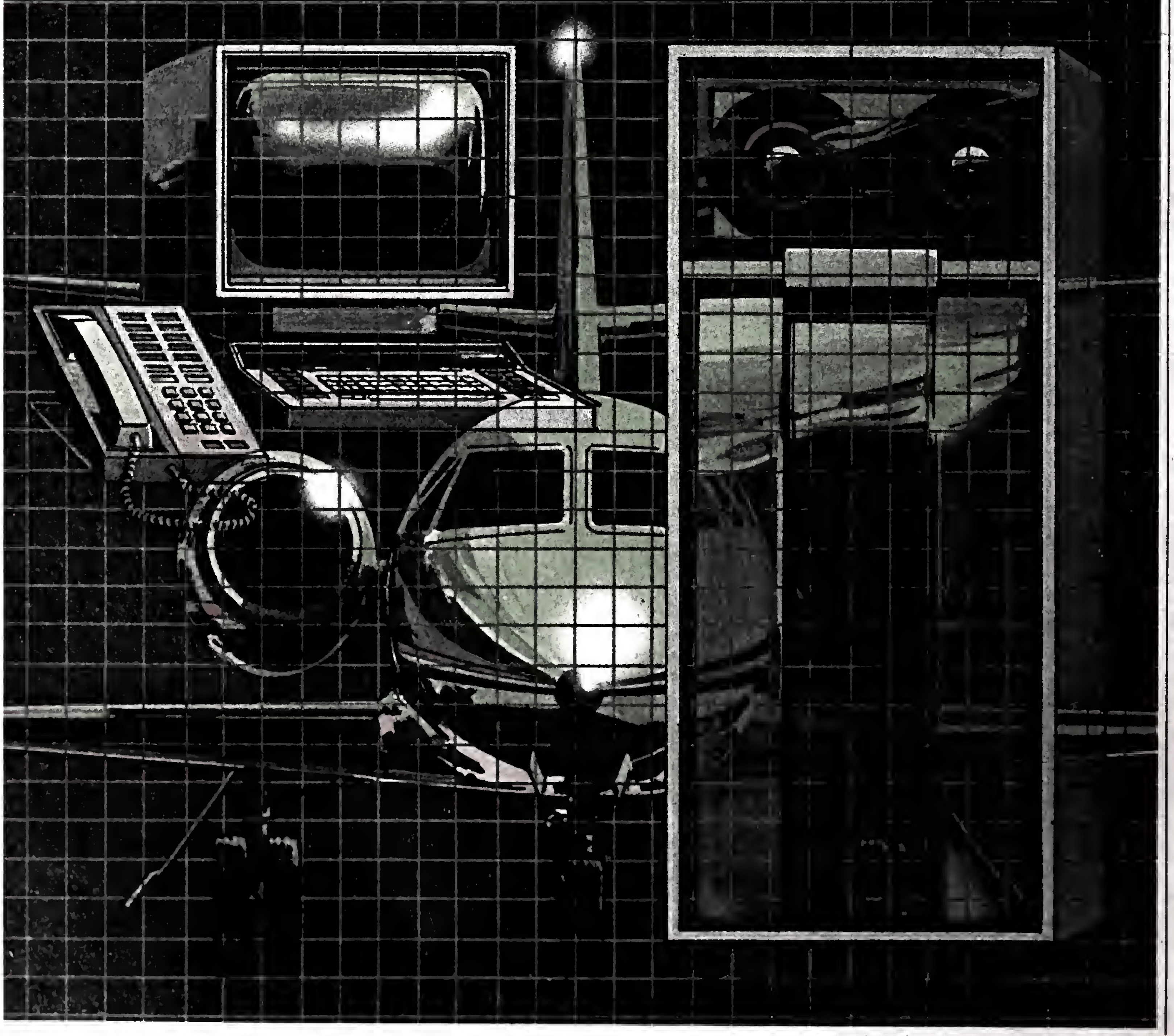

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> *In the fourth and fifth generations, documentation converges on design. Users stop asking how well-documented the system is and start asking why the system needs so much documentation.*

what users and systems do and to referee heated arguments between business professionals and software wunderkind.

The best ones also have the knack of suddenly becoming blissfully naive about computers when it comes time to explain a procedure to a neophyte user.

Separate but united

Inevitably, there is some specialization among support engineers. Those who support managers and executives are often trained in management science and technology (financial analysis, operations research and so on), while those who work with clerks and neophytes tend to be from instructional technology or CBT.

Whatever their specialties and job titles, though, support engineers are united by their loyalty to the best interest of the users and customers and by a sense that, given the right mix of information products and services, a system can be operated effectively.

The next few years will be a time in which support technology improves dramatically. New storage and video hardware will make on-line manuals even more attractive and readable. There will be new ways to look things up, several of them involving lasers.

The skills of the manual writer will evolve into the skills of the information support specialist. Already, public seminars on user documentation include sections on how to write Help screens and interactive tutorials.

Internal support

The next issue in documentation is internal support. A procedure that needs external support is less reliable than one that does not. Thus, whenever there is a choice between supporting a procedure with a clever document or changing the procedure so that it does not need support, the wise technical writer will recommend the latter.

The best news about the future is that everything the support engineers are learning about user needs and proclivities — what they incorporate into usable manuals and Help screens — will be directly useful in the future.

In the fifth generation, systems will be expected to deal with the users, a skill that many systems analysts haven't learned yet. Today's technical writers will be teaching systems how to adapt to their users, a subject on which the writers are the undisputed experts.

Eventually, though, the next era will begin — not because someone invents a more spectacular way to show a book on a screen, but because someone will decide it is time for the technology to adapt to the user instead of the reverse.

About the author

Edmond Weiss is an independent consultant based in Cherry Hill, N.J. Weiss teaches seminars in technical communication and documentation.

He is the author of How to Write a Usable User Manual *(ISI Press, Philadelphia, 1985).*

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A new generation of powerful, ultrafast semiconductor microchips can soon be produced at rates required for commercial manufacturing, using the world's most sophisticated electron beam lithography system. The system is capable of writing circuit patterns with features as small as 0.5 micrometers — about 1/200th the diameter of a human hair. It was accepted recently by the U.S. Department of Defense for its VHSIC (very high speed integrated circuit) program. The acceptance culminates four years of development by Hughes Research Laboratories and Perkin Elmer Corporation leading to the direct-write system.

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A prototype Amraam missile passed within lethal distance of a target aircraft in the first guided launch of its full-scale development program. The unarmed weapon was launched from a U.S. Air Force F-16 flying at Mach 0.85 at an altitude of 21,000 feet. It was fired from behind a QF-100 drone flying at Mach 0.7 at 21,800 feet over White Sands Missile Range in New Mexico. Telemetry data indicate the 12-foot-long, 335-pound missile met all test objectives. The flight also verified Amraam's interface with the F-16's avionics system and the performance of its active radar guidance capabilities. Hughes is developing the AIM-120A advanced medium-range air-to-air missile and its companion rail launcher for the U.S. Air Force and Navy.

A new 6x9-inch minicomputer executes one million instructions per second for a U.S. Navy communications terminal. The small rugged computer, developed by Hughes and designated the HMP-3220, is part of the Joint Tactical Information Distribution System (JTIDS) terminal. It executes standard Navy software written in the CMS-2 high order language. The computer uses a combination of advanced CMOS configurable gate array and advanced Schottky integrated circuitry packaged in digital hybrid technology. This advanced design and packaging concept enables two central processors (each with a 96K word ultraviolet erasable memory, 32K words of CMOS static random access memory, and a common data bus input/output interface) to be contained on a single, pluggable circuit card assembly. Total power consumption is less than 120 watts. JTIDS is a secure communications network used to link U.S. armed forces. JTIDS uses several computer-assisted techniques to transmit data while preventing enemy jamming and interception.

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Although the technical challenges of implementing data administration are formidable, they are relatively small in comparison to the political, organizational and emotional issues facing the data administrator. If these issues are not understood or are ignored by an organization prior to instituting a data administrator function, the long-term success of data administration could be jeopardized.

The Politics of Data

By William Durell

The first challenge that data administration faces is a general lack of understanding of its purpose and nature. Many organizations perceive data administration in a purely technical light. If you ask the average data processing professional for a definition, the answer would probably express the technical aspects of a data dictionary or data base management system. Although these are two tools used by the data administrator, they are merely a means to an end and are certainly not the objective of data administration.

The objective is not to install and implement data base management systems and data dictionaries, but to use these as tools to achieve the management and control of information within the entire enterprise. Data administration is as much a managerial function as a technical one. Therefore, the data administrator must advertise and

Balancing the issues

Technical issues often overemphasized	Nontechnical issues often underemphasized
What DBMS should we purchase?	What information is most critical to the success of the company?
What data dictionary should we purchase?	What are the basic categories of information within our organization?
What fourth-generation language should we purchase?	How can the quality, timeliness, reliability, consistency and accuracy of this information be improved?
What query language should we purchase?	How can this improved information make us more competitive/profitable?
If we buy these products from different vendors, how will the interfaces be built?	How many data bases should be developed? What is the optimum number?
How will these be interfaced with our existing tools?	When will these data bases be developed to best complement our plans for application systems development?
How much disk space is consumed by the DBMS?	How can we reduce data redundancy?
	How can our data bases be designed to reduce future maintenance?

CW Chart

Figure 1

emphasize the global data management aspects of his job to overcome the preconceived notion that it is technical in nature.

An organization tends to spend large amounts of time and money analyzing the advantages and disadvantages of various commercially available data administration software and hardware products, yet it ignores those data management problems that are nontechnical in nature.

For example, it is not unusual for a large organization to spend 12 to 24 person-months evaluating and selecting a DBMS. An equivalent amount of time is often devoted to the evaluation and procurement of a data dictionary system.

Yet most organizations are reluctant to spend even a fraction of these resources to analyze the nontechnical problems of information management. This analysis must include business systems planning and entity analysis activities.

Figure 1 illustrates the typical overemphasis on technical solutions and underemphasis on nontechnical problem solving.

Planning and control

The benefit of automated tools such as DBMS and data dictionaries can only be realized through proper planning, control and use of the tools. For example, many new users of data dictionaries haphazardly populate their tools with information from existing applications. Little thought is given to the benefits or costs of this approach or to how this information will be maintained once it is put into the dictionary.

Likewise, many new DBMS users load the DBMS with data stored in existing files. The only thing that has changed is the data access methods involved. Often nothing is done to improve the quality of the data or to reduce data redundancy.

Most problems of data redundancy and inconsistency cannot be blamed on the lack of quality data tools. Many cannot be solved with technical approaches because they are organizational, political and managerial in origin. To expect hardware or software tools to solve these problems is to use the tools as a scapegoat for the more basic, nontechnical problems.

While it is important that a company answer the technical questions related to information management problems, an enterprise must also address the following nontechnical issues:

- Does the existing organizational structure of the DP staff encourage the proliferation of redundant data to support different application systems? For example, do the payroll system and the personnel system each have their own data bases of redundant employee information? Do the purchase order system and the merchandising system use separate data bases that contain redundant customer information?
- What changes could be made to the DP organization to reduce data redundancy over the long term?
- What changes can be made to improve the communications and coordination necessary so common data can be shared among different application development groups?
- Do the existing end-user departments dictate the creation of overlapping DP systems and thus foster data redundancy? How can the lines of communication among end-user departments be improved to help reduce this problem?
- What can be done to pursuade end-user organizations to share funding for the development of common data, increasing the amount of common data used?
- How can the DP and end-user organizations better understand the commonality or similarity of information resources?

Data administration is at a disadvantage politically within the company because neither its goals nor its accomplishments can be measured by the traditional means used to evaluate other members of data processing. Data processing personnel traditionally have been measured by quantitative means, such as project budgets, elapsed time to develop a system, number of programs written, number of lines of code completed, number of terminals installed, number of manual processes automated and reduction in clerical work force.

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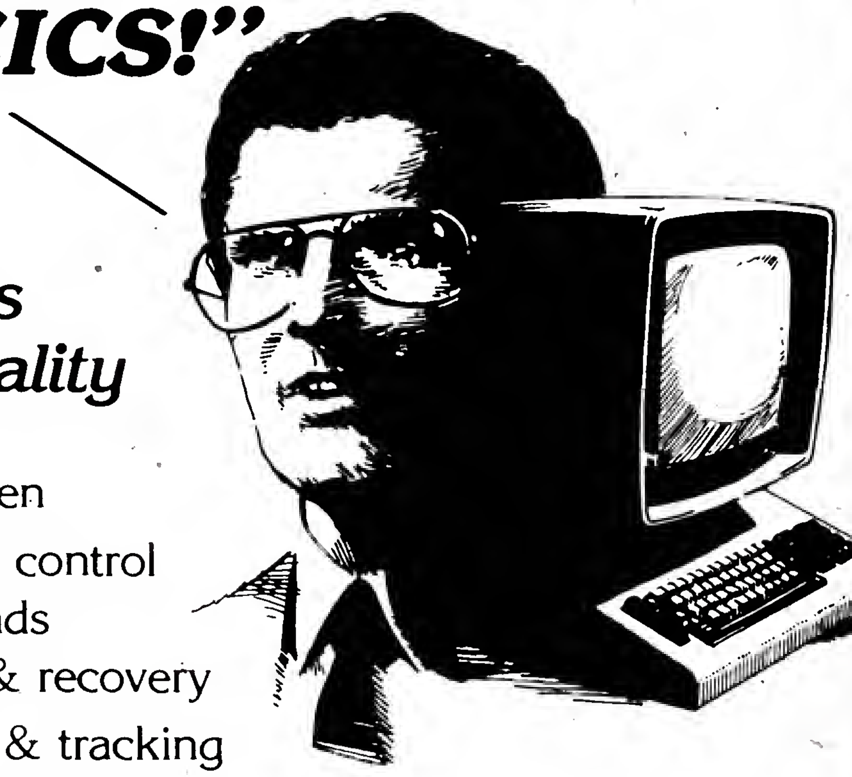

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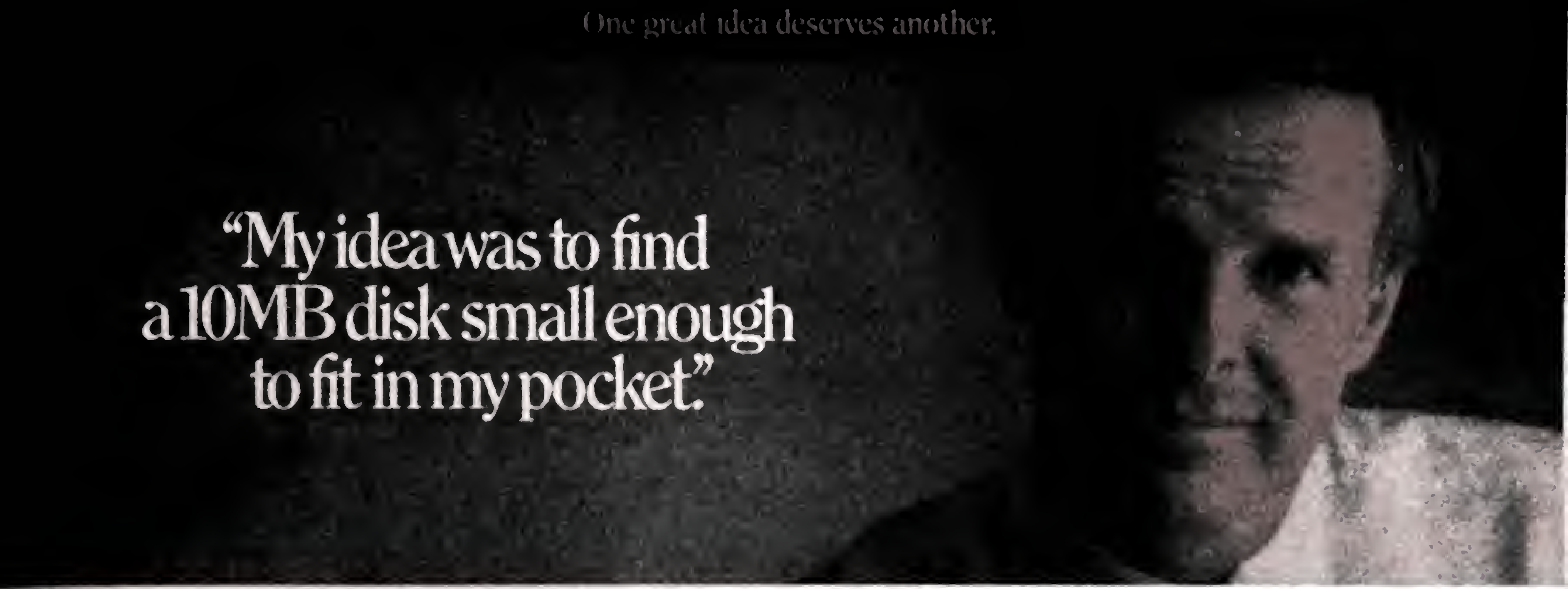

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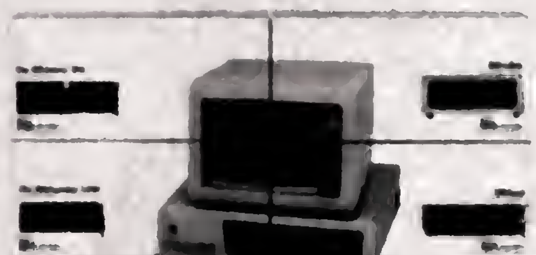

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resources. Efficiency of operations may be measured simply in terms of CPU cycles and disk space consumed, response time and throughput from data entry to output.

Data administrators, to their chagrin, are sometimes judged by these same standards. Data administration must not be judged in terms of volume of metadata. How does one measure the reduction in redundancy or the improvement of the consistency of data that has been achieved by data administration? It would be ludicrous to measure a data administrator by the number of data elements loaded into a data dictionary or the number of data bases that have been implemented.

> ”
>
> *The success of an applications development group can be measured in terms of elapsed time and cost . . . The success of data administration, on the other hand, should be measured in terms of long-term reduction of overall data redundancy and improved quality of information.*

On the contrary, an inverse relationship exists between the quality of information and the quantity of data. For example, the data administrator employs information modeling techniques to reduce the number of data bases developed and at the same time increase data sharing.

A significant problem for data administration is the lack of tools or techniques to measure the quality of information. Quantity is much easier to measure than quality.

Another difference between the evaluation of DP and data administration staff members is the length of the evaluation period required. The goals and objectives of DP tend to be short-term and local in nature, data administration long-term and global.

The success of an applications development group can be measured in terms of elapsed time and cost to implement a single application system. The success of data administration, on the other hand, should be measured in terms of long-term reduction of overall data redundancy and improved quality of information throughout a company.

Thus, the evaluation period required to assess accurately the success of the data administrator is longer than that of a member of the applications development staff.

A trendy issue

Many organizations implement data administration without sound motives for doing so. This reflects a lack of understanding of the nature, purpose and benefit of information management.

Some organizations are motivated to create a data administration function out of fear of falling behind the competition if they fail to do so. Others feel compelled to establish data administration because they perceive that it is the trend of the DP industry. Their curiosity about data administration is aroused by seeing articles on data administration in DP trade publications or hearing about it by word of mouth.

Still others are introduced to the concept of data administration by data dictionary or DBMS salespersons. Only after a data dictionary is purchased does someone ask, "What are we going to do with this?"

Thinking that they have purchased the tool and must now rapidly populate it so they can demonstrate some return on investment, these managers next ask, "What person or organization will be responsible for its maintenance?" This leads to the creation of data administration for the wrong reasons.

The proper approach would be to analyze and understand the cost of data administration, how it can improve the quality and value of a business' information and how this improved information can make the business more competitive. Unless an organization understands the real value of data administration, this

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resource management function will merely exist, and never become a viable and beneficial part of the enterprise.

Methodology and creativity

The objective of data administration is to make the collection and use of information more uniform and consistent. The human being is a creative and imaginative creature and does not always enjoy performing the same tasks in the same manner, but consistency and standardization in data are crucial. Somehow the data administrator must combine intuitive or creative instincts in data design with a scientific, rigorous, methodical approach to data management.

The techniques used in entity-relationship-attribute modeling and logical data base design, for example are based on sound and precise mathematical principles. The successful implementation of data administration requires a significant change in the approach to data design and an overall shift in its emphasis from artistic to scientific.

We live in a prescription-oriented society. When we have a headache, we take an aspirin. When we have a stomach ache, we take an antacid. We search for "fast, fast, fast relief." Management also often looks to technical solutions as quick fixes for its data management problems.

However, as discussed earlier, many of these problems are not technical in nature. Many problems of inadequate information are related to problems of organization, lack of planning, lack of proper management, coordination and communication. And unlike technical problems, they cannot be solved quickly.

Many solutions of data management problems require changes in methodology, not technology. However, changes in technology can often be achieved faster than changes in methodology.

Changes in software or hardware can often be achieved faster than changes in the way people perform their jobs. Changing the manner in which a human being works requires selling and marketing efforts, creating a perceived need, communication, friendship and persuasion. These efforts often require several iterations and years to effect.

Challenging precepts

Traditional process-oriented design does not take into consideration the need for overall coordination and planning of data across application boundaries; rather, it concentrates on integration of local data within single application systems. The data administration professional understands that global planning of information must precede local data base development.

Data administration concepts advocate changing the sequence of events in traditional system development to shift the emphasis from process orientation to data orientation. The focal point of DP should be an integrated information model, and application systems should be developed on the periphery of this model. However, traditional process-oriented design dictates that peripheral interface data is necessary to integrate centralized hubs of applications. Thus, data administration challenges the basic process-oriented approach that has been employed during the last 20 years. This can be disconcerting and sometimes insulting to many long-time DP professionals.

The solutions to data administration problems advocated by the data administrator first require the identification of the data management problem itself. The worst problem is the one that goes unrecognized. Most DP organizations do not perceive the existence of data integrity problems. Many organizations have lived in a situation of data incompatibility and inconsistency for so long that, to many, this is a normal situation.

Some of these professionals may ask why there is a need for data management solutions when no problem currently exists. Because data administration discovers and advertises the existence of data integrity problems, it is accused of creating blemishes on the record of DP, when in fact it is only illuminating them.

Vertical monopoly of data specialists

- Data administrator
- Information modeler
- Data analyst
- Data base administrator
- Data base analyst
- Information center specialist
- Data dictionary technician
- Data librarian

CW Chart

Figure 2

Effective data administration requires several changes in the traditional responsibilities of data design and management. First, data administration employs a logical data analysis and a design specialist (the data analyst), which necessitates that the systems analyst and/or data base analyst relinquish this responsibility. Second, data administration advocates a shift in certain data design responsibilities — data element definitions, logical data base design and entity modeling — from DP to end user.

Traditionally, some data analysis and logical design tasks were performed within the data base administration or system development departments. Unfortunately, these data-related tasks were often performed on a part-time basis and were not given the necessary priority. The data administration seeks to concentrate these efforts into one organization.

Data administration advocates a vertical monopoly of personnel (Figure 2) that specialize in the entire

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Within two hours after the last runner had crossed the finish line at the Harrisburg Marathon, Pennsylvania Blue Shield, chief sponsor of the annual event, had completed a computer-generated report on the run times and standings of the Marathon's 900 entrants and delivered it to the news media.

This was in sharp contrast to the previous year when it took approximately three days to get the Marathon results to the media. The greater responsiveness this year was largely the result of moving the Marathon application from an in-house Prime computer to Blue Shield's IBM 3081 system running in an IMS environment. The reprogramming of the Harrisburg Marathon application, completed in record time, was Blue Shield's initial test project for MARK V and MARK IV, Application Development Systems from Informatics General Corporation for generating online and batch applications respectively.

"We wanted to get acquainted with MARK V on a relatively simple and straightforward application like the Marathon before we began our full-scale pilot project, a new online claims processing system," Thomas M. Cline, Systems Development Supervisor, explained.

Programming the Marathon application consisted basically of creating and maintaining an online Entrant File including four screens to (1) maintain basic entrant information (name, address, phone number, and a "TAC" number to be used for Olympic identification in case the runner qualifies for the U.S. Olympics), (2) maintain control information (payment of fees, lunch and dinner reservations, etc.), (3) record the run time of each of the approximately 900 entrants; and (4) provide a menu for accessing the other three screens.

To produce reports in addition to the online portion of the Harrisburg Marathon application, Blue Shield used another Informatics Implementation System, MARK IV, to produce the required batch reports. A productivity tool designed for generation of batch applications, MARK IV also had its "trial run" for Blue Shield with the Marathon application.

Approximately 12 different reports were produced for the Marathon, including check-in sheets for use on the day of the race (cross-referencing the runners alphabetically and by runner number), three sets of mailing labels, and several types of reports listing the finishers by time, sex, and class of the runner. The reports on finishers were prepared for the news media, for internal use, and for the Athletic Congress listing any runners who qualified for the U.S. Olympics.

1983 was the eleventh year that the Harrisburg Marathon has been run. Unlike the famous Boston Marathon, which requires that entrants meet qualification standards, anyone can enter the Harrisburg event. The grueling course — 26 miles and 385 yards in length — begins near the Pennsylvania State Capitol building and winds through the streets of Harrisburg and the surrounding countryside.

Each year, large numbers of Pennsylvania Blue Shield employees volunteer their time to help with the race. "Probably 30 percent of our DP staff were involved in some kind of volunteer work for the Marathon," said Hugh Gallagher, also a Systems Development Supervisor, who coordinated the record-keeping for the Marathon. "This included registering entrants, manning water stations, keeping track of times, all sorts of things. For example, our Director of Systems Development, Karl Mundis, was in charge of one of the water stations, and I was in charge of the finish line."

Everything about the Marathon was done on a volunteer basis — including the programming for the new online Entrant File application, which was done primarily in evenings, lunch hours, and weekends, with Tom Cline doing most of the programming himself in MARK V and MARK IV.

"Our time for preparing this was so short that some of the software had never been tested prior to the day of the race," Gallagher recalled. "Fortunately, it worked like a charm."

"One of the things I found in implementing the Harrisburg Marathon application was that you don't need a lot of in-depth knowledge of IMS to use MARK V in a straightforward application like this, where you're just going in against a data base to update and add segments," Cline noted.

"I found that MARK IV and MARK V complemented each other very well," Cline added. "I found that with MARK IV, once I had established a set of reports, it was very easy to go back in and change a report, or set one up with a different set of selection criteria. I found I could make a change to a report in minutes. If I'd been working with COBOL, as I have in the past, this would not have been a matter of minutes."

"So far, we've only just gotton our feet wet with MARK IV and MARK V," Cline concluded. "But it looks quite promising in terms of potential productivity increases. I'm particularly impressed by the flexibility I've seen in setting up our initial application — the ability to make changes in a very short period of time."

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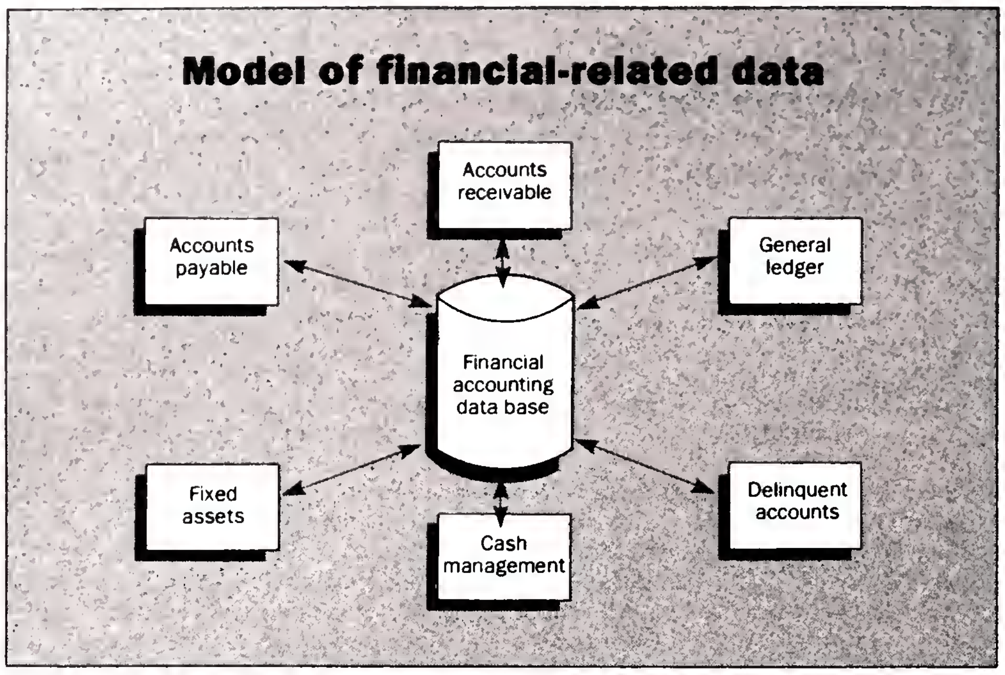

Figure 3

spectrum of information management, from initial planning to final design. These specialists administer and manage information from the global, information modeling level to the local, application design level. Thus, the data administrator seeks to create a "data organization" parallel to the traditional system or application development organization.

Administration vs. processing

In many ways, the methods and objectives of data administration are in direct contrast to those of DP. These contrasts include methodology, organization, responsibility and philosophy.

First of all, the data-driven data administration approach is quite distinct from the traditional process-oriented DP approach to systems development. Data administration advocates a centralized hub of information (the information model) surrounded by a periphery of application systems. (Figure 3). The traditional DP approach directs the creation of single-purpose data bases built in support of single-application data processing systems. (Figure 4, ID/31).

Significant differences in the timing, sequence and importance of tasks exist between the process-oriented and the data-oriented system development scenarios. The traditional DP approach dictates that data be subordinate or subservient to application-oriented systems.

The data administrator handles application programs and systems as the input and output procedures for a centralized data base. The administrator recommends the analysis of the information requirements in parallel with or prior to the analysis of the process (function or service) requirements.

Structure

Many DP organizations are established and structured to support application-oriented programming staffs that in turn support single end-user departments. Different project leaders are often designated to support individual human-resource applications such as payroll, personnel and benefits systems. These systems are built to service single end-user organizations such as the payroll, personnel and benefits departments, respectively.

However, the data administration organization is structured around the management and control of each subject-oriented subset of the global information model, such as all employee-related data. This leads to the concept of several subject data administrators within a large company.

In the early days of DP, one technician (such as the programmer/analyst) assumed responsibility for the majority of DP-related tasks. As DP became more specialized, the traditional roles of DP personnel were divided between software and hardware responsibilities.

This boundary lay between the personnel in and around the computer room and those external to computerized hardware and facilities. These personnel were typically labeled operations and applications.

The recent impetus to management information as a corporate asset has affected the way DP professionals are organized and created new specialists within DP. These new specialists are data-oriented, whereas the traditional DP roles are process-oriented (Figure 5, ID/31).

This segregation of responsibilities is advantageous for two reasons. First, specialization should permit personnel to narrow their range of responsibilities and thereby produce a higher quality product. Second, it can relieve conflict between the data administration and data base administration specialists.

This is particularly true if the data analyst (responsible for logical data base design) reports to data administration, yet the data base analyst (responsible for physical data base design) reports to systems development or a separate data base administration organization. Third, it improves the coordination and communication among data-oriented specialists.

However, the situation pictured in Figure 5 requires that the systems

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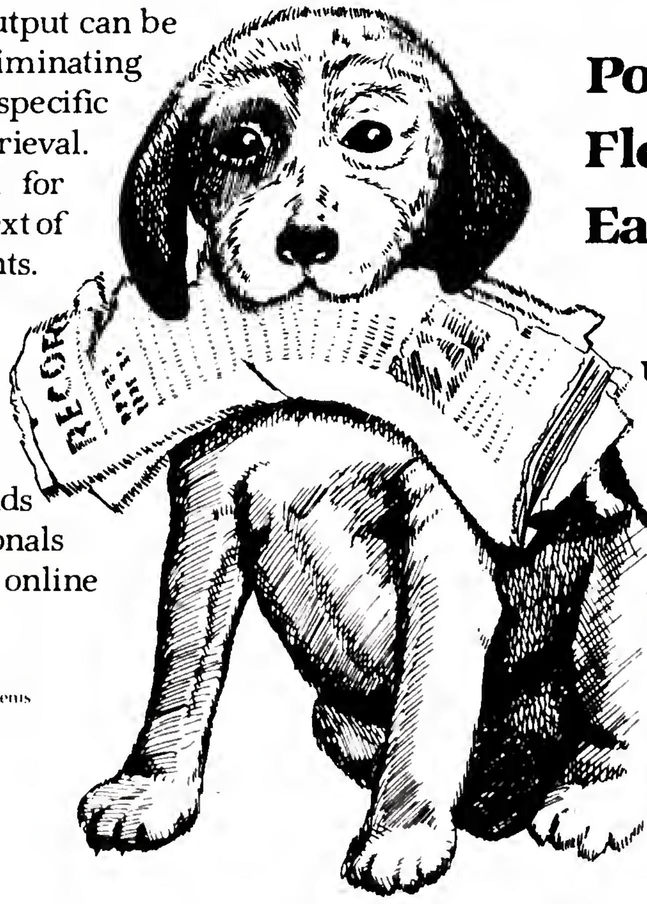


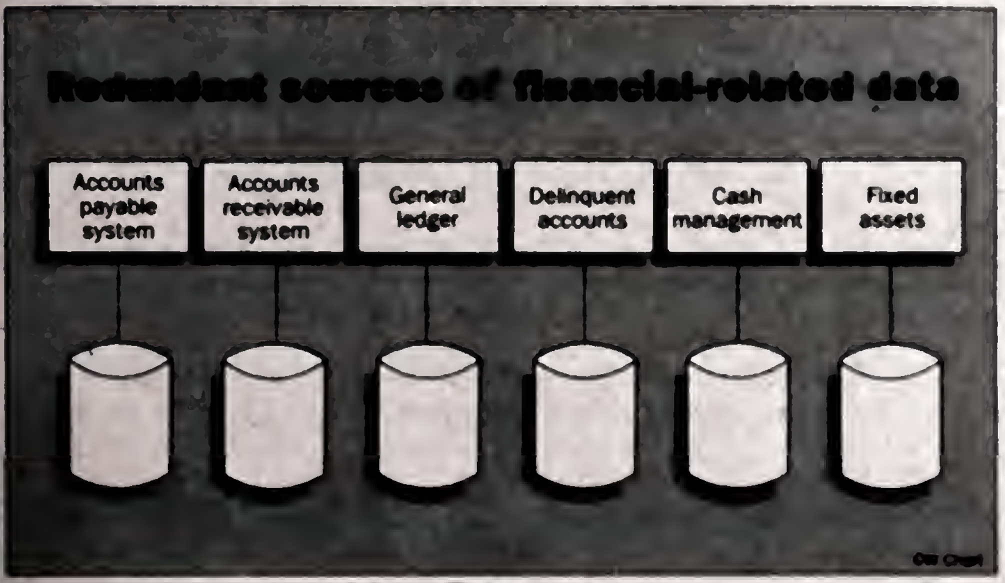


Figure 4

development staff relinquish responsibility for the design and maintenance of data structures. Systems analysts or programmer/analysts have traditionally designed and developed their own tables, files, records and data bases. The data monopoly illustrated shifts this responsibility to data administration.

The pride of ownership issue involved in this transition is a very real one. The data administration is committed to tearing down the data ownership walls that stand between application systems and to socializing the ownership of information among all applications.

The sharing or use of external data by an application-oriented staff is not easily achieved. Typically, various application development groups operate autonomously and develop their own data structures to support privately developed systems. The "not invented here" attitude toward foreign data bases is as real as the resistance to buy "not built here" proprietary software packages.

End-user tasks

In pursuit of its goals, data administration often displaces the data analysis and design responsibilities traditionally assumed by systems analysts and programmers and encourages assumption of these responsibilities by the end-user organization whenever possible.

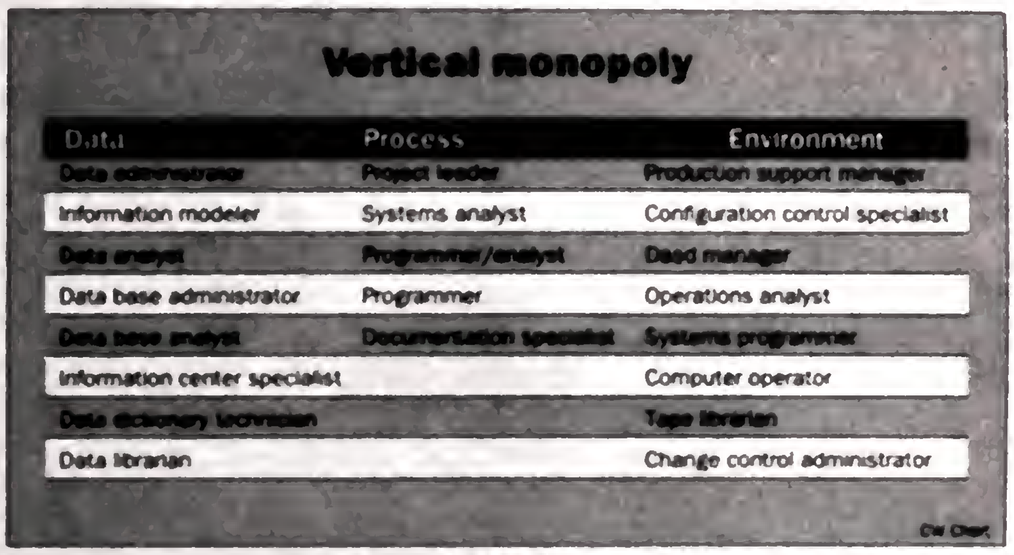
In some organizations, responsibilities such as data element definition and naming, information modeling, user-view synthesis and logical data base design have been successfully completed by end-user staff. Often, these activities are performed by end users with only the supervision and guidance of data administration.

This shift in the responsibility of data analysis and design is yet another example of the gradual but steady transfer of tasks from DP-oriented systems development to user-oriented development. Thus, data administration is a catalyst in the transfer of traditional DP responsibility to the end user.

The data administrator feels that, whenever feasible, DP should get out of the "process" (applications or programming) business and concentrate on the business of managing and inventorying information for use by the end user. Data administration emphasizes not only the rigorous analysis and design of information but also the prototyping of processes by end users, using fourth-generation languages.

A strong data administration model dictates that DP should concentrate on the acquisition, control, security and management of data for the end user but that the end users themselves should be allowed to control how this data will be reported and used. Because of these factors, data administration is sometimes perceived as a further threat in the displacement of DP responsibility to the end user.

And data administration is circumventing DP in other ways. First, the data administration encourages the design and storage of all logically related data in one repository. This consolidates the information needed by the end users and eliminates the



Vertical monopoly

Data	Process	Environment
Data administrator	Project leader	Production support manager
Information modeler	Systems analyst	Configuration control specialist
Data analyst	Programmer/analyst	Dasd manager
Data base administrator	Programmer	Operations analyst
Data base analyst	Documentation specialist	Systems programmer
Information center specialist		Computer operator
Data dictionary technician		Tape librarian
Data librarian		Change control administrator

CW Chart

Figure 5

ECONOMY

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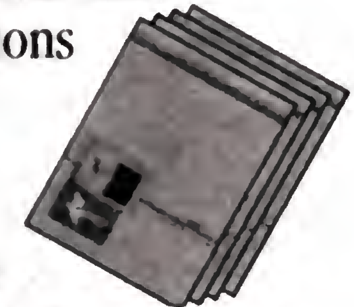

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need for data processors to sort, merge, synthesize, filter and extract data from several sources in order to present it to the end user.

Second, the data administrator advocates the storage of data in more user-friendly tables (called relations or relational data bases). Data is formatted and represented in rows and columns and is more accessible than it would be in traditional hierarchical or relational data bases. It appears as spreadsheets and does not require translation or interpretation by the DP professional.

Third, metadata — documentation about the data — is prepared by the data administrator to permit the end users do their own retrieval of needed data. The data dictionary represents a self-service index of information.

Technology conflict

Another potential conflict between data administration and DP concerns computer technology. Data administration tends to ~~be~~ more business-oriented, and DP tends to be more technically oriented.

Data administration stresses the need to understand the relevance of information to the competitive success of the business. DP tends to concentrate on how the machine or software can most efficiently use data. The data administrator feels that it is part of his job to understand the nature of the company's business, what data is most important to the success of that business and how best to manage this data.

There are several reasons for the technical orientation of DP. First, DP was established to manage computers and computer support staff, not necessarily information. DP management is directed to manage the finances of computer equipment and personnel, not to improve the profitability of the company via better data and better business decisions.

Second, monetary rewards traditionally have been associated more with technical expertise than with business information expertise; therefore, DP personnel have commanded relatively high wages because of their technical knowledge.

But the data administrator relies on an understanding of the overall business and its data more heavily than on computer technology. This is indeed a monetary threat to those DP professionals who are fearful that their technical knowledge will be devalued.

And their concern is legitimate to some degree. It is relatively easy to become proficient in IBM software and hardware technology and to sell your skills from one company to the next. It is much more difficult to specialize in the information needs of an aerospace company and then change your career to an insurance business.

> ”
>
> *Data administration stresses the need to understand the relevance of information to the competitive success of the business.*

Impact on end users

Traditionally, DP management instigates the development of single-application computerized systems to respond to requests for DP services from individual end-user departments. Thus, the DP staff consists of distinct groups of programmers and systems analysts servicing separate end-user units.

For example, a centralized personnel system is developed and maintained under the direction of the personnel systems project leader. The development of this system was sponsored, funded and finally accepted by the personnel department.

Likewise, a centralized payroll system is developed and maintained under the direction of the payroll systems project leader for a single end-user organization — the payroll department. This scenario is typical of many other DP systems that have been built in a piecemeal, uncoordinated fashion.

There are several unfavorable consequences of this method of development. The first is that end-user management is expending funds and staff to support redundant data — each department maintains complete employee records.

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The second is that excessive DP staff must be committed to develop and maintain duplicate systems and data bases that support this redundancy. Furthermore, a network of additional interface software, controls and auditing capabilities must be built to maintain consistency of data between the two systems.

Duplication costly

Because of the complexity of both data and processes, the systems are more costly to maintain. The elapsed time to make enhancements increases, and the responsiveness to changes requested by the users often decreases. This situation also limits the availability and accessibility of employee information to each user area.

For example, the payroll supervisor may not have access to data maintained on the personnel data base, and the personnel manager may be ignorant of certain employee information available on the payroll data base.

The data-driven approach to human resource allocation dictates that payroll and personnel data be consolidated into a single subject data base of employee information. This data-driven approach requires significant changes on the part of end-user management.

Joint funding

The most significant change is that the two departments must share the funding for the development of a common data base. This joint funding arrangement often requires considerable marketing efforts on the part of the data administrator.

The cost for this common data base can be itemized as follows: information modeling for employee-related data, data element standardization and definition, logical data base design, physical data base design, conversion of existing payroll data and conversion of existing personnel data.

Assuming that a shared-funding arrangement can be accomplished, the next most formidable challenge arises during the design of the data base itself. The data administrator has the unenviable job of arbitrating between the two user areas concerning the standardization and consistency of the data to be stored in the data bases. Data element definition, format, length, edit requirements and code values must all be standardized between the end-user departments.

Drastic differences in data naming and format might exist between the data owned by each user area. For example, the employee salary field on the existing payroll files could be represented as a weekly amount, but on the personnel file this could be stored as an hourly amount.

The data administrator must be tactful and diplomatic in order to persuade the departments to arrive at some equitable information definitions for the common data base.

The end-user organizations must also address the data ownership issue. Since common employee-related information will now be maintained by both departments, it is essential to reach agreements concerning individual responsibilities for inserting, changing and deleting employee data. Data deletion or archiving can now be permitted only with the advise and consent of both end-user departments.

> ”
>
> *Because data base administrators concentrated on the local management of individual data bases, data administration was created to fill the void in the global management, coordination and consistency of all corporate information.*

Often for the first time, the shared data base environment requires user involvement on data ownership and security issues. Because the common data base can now be accessed by a greater variety of users, all end-user organizations should implement formal data security procedures for employee data.

Most data base administration organizations were created to control and coordinate DBMS activities and data base interfaces with application programs.

Data base administrators were usually assigned to develop and maintain application-oriented data bases and single data base systems. The administrators were usually only responsible for physical data base design.

The data analysis and requirements were often dictated by applications development. Thus, data base administration had little if any, control over data redundancy or the planning of a data base across multiple systems.

Because data base administrators concentrated on the local management of individual data bases, the data administration function was created to fill the void in the global management, coordination and consistency of all corporate information.

Umbrella organization

The data administration organization in many companies has evolved as the umbrella organization containing the data base administration

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staff. Because the data administrator and the data base administrator specialize in logical and physical data base design, respectively, the potential exists to create some antagonism between the two specialties.

Shifts and conflicts

Data administration is chartered to maximize the flexibility and modularity of data base design, which tends to degrade the performance of the data base and thus to conflict with the goals of data base administration.

Placing data base administration within data administration reinforces for the data base administrator the importance of reducing data base labor costs, and data base machine costs become secondary in importance. Thus, the traditional data base administration responsibility — machine optimization — becomes secondary to the data administration responsibility — labor optimization.

The shift in emphasis from machine costs to labor costs is one indication of the gradual but steady shift in importance from data base administration to data administration. Relational data bases (as advocated by data administration) can also have significant ramifications for data base administration. Since relational data bases are easier to use and understand than other types of DBMS, the need for the data technician in data base administration diminishes.

In a relational environment, logically analyzing and modeling the information prior to physical data base design becomes critical. Because normalized data is much more fragmented than typical raw data, the need to understand the logical relationship of information between relations also becomes critical.

Thus, in a relational environment, the need for data administration increases, and the need for data base administration should decrease.

The metadata maintained on the data dictionary also decreases the end-user reliance on data base administration staff for information concerning the contents of the data base. Also, data base machines can potentially reduce the need for human involvement in data base backup, recovery and reorganization. This will further erode the importance of data base administration.

The data administrator

The misunderstanding about data administration and its provocative nature have certainly taken their toll on the data administrator and the data administration organization itself. Some organizations have made several attempts at data administration before finally achieving some level of success.

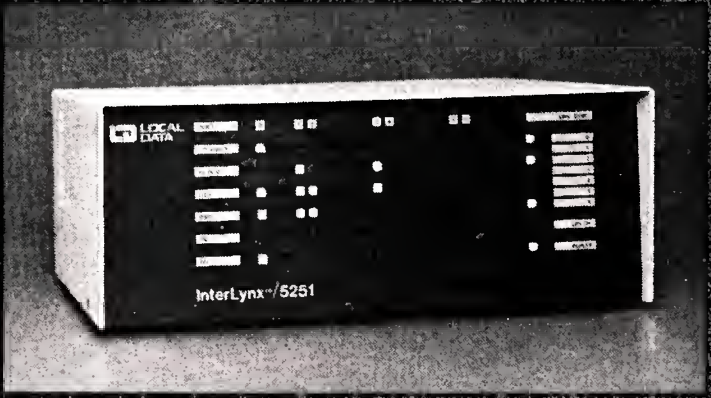
Compared with other professions, the turnover rate of data processors is above average. However, the turnover rate among the data administration staff appears to be higher than that of other DP staff members.

Significantly, although this turnover rate is high, few data administrators leave data administration to return to traditional DP ranks outside of data administration. On the contrary, most unhappy or unchallenged data administrators will shift companies but not roles.

Most data administrators are more dedicated to their profession than to their employer. Although there is a great deal of skepticism, pessimism and uncertainty surrounding data administration, many data administration personnel are convinced of the necessity of their roles and dedicated to the task. The typical data administrator is convinced that the global planning, management, control, inventory and integrity of information are essential to the long-term profitability of an enterprise.

About the author

William Durell is president and founder of Data Administration, Inc., a California corporation that specializes in information resource management. During his 13 years in DP, he has worked as a programmer, systems analyst, project leader, data analyst and data administrator. He is the author of Data Administration, *a guidebook on the implementation of data administration.*



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MICROCOMPUTERS

HP offers Laser Jet Plus in high-end printer mart

By Jeffry Beeler

CUPERTINO, Calif. — Hewlett-Packard Co., seeking to address the high end of the personal computer printing market, has complemented its original Laser Jet printer with an enhanced model that yields improved output quality.

HP also trimmed the price of its existing Laser Jet from $3,495 to $2,995 — a reduction of slightly more than 14%.

As its name suggests, the new Laser Jet Plus is targeted at the portion of the microcomputer laser printing market that HP's first offering intentionally ignored. Announced in May 1984, the vendor's original Laser Jet model is configured to address 80% of the market for office personal printers.

Now, with the introduction of Laser Jet Plus, HP is reportedly taking aim at the remaining 20% of the market, which demands higher-than-average print quality and is willing to pay a reasonable premium to get it.

The new device's key difference is expanded memory. HP has equipped Laser Jet Plus with 395K bytes of user storage, compared with the original version's 56K bytes, according to Roger Archibald, a project manager with the firm's Boise, Idaho, division.

Expanded memory yields improved resolution and output clarity. When producing full-page images, Laser Jet Plus can squeeze 150 dots into a single inch, vs. 75 dot/in. for its predecessor, Archibald said. For half-page images, Laser Jet Plus' resolution improves to 300 dot/in.

The increased dot density enables the latest member of the company's laser printer family to create characters and graphics exceeding the capabilities of the original Laser Jet model. Laser Jet Plus, for example, can print characters as large as 128 dots high, compared with the previous HP limit of 64 dots, Archibald said.

The system's superior resolution also reportedly lends a sharpness and a professional look to forms and graphics that otherwise would fall noticeably short of letter quality.

Laser Jet Plus' other main features include the ability to store up to 32 electronic forms in its internal memory and to download additional forms, logos or letterheads, Archibald said. The enhanced unit can also download fonts and thus circum-

Continued on page 86

Add-on graphics processor out

Superset, Inc., based in San Diego, has announced an add-on processor that reportedly supports 48-bit, virtual memory mainframe graphics on the IBM Personal Computer, XT and AT.

The XP/48 Graphics Extension Processor is said to support 4096- by 4096-pixel resolution graphics, 24-bit color depth and graphics such as bar charts, exploded pies, shaded fonts, three-dimensional surfaces and axes and spline or polynomial curves.

Other features include full digitizer support, user extendable fonts and multipass rasterization with halftoning, paneling and color separation.

The basic system consists of an expansion bus card and a cabinet with a 48-bit virtual processor, 400K-byte error-correcting memory and a 20M-byte hard disk.

Based on Fortran

The XP/48 is Fortran-based, with a Fortran 77 compiler and debug facility.

The XP/48 is said to support all of Superset's graphics applications packages, including interactive data-driven graphics, device independent plot manager, solids modeler and large-scale Personal Computer board schematic design with autorouting.

The system will be available in November for a base price of $10,000.

SMALL TALK
Edward Warner
CW Senior Writer

MMA, Tasc: joint venture?

The Microcomputer Managers Association (MMA), a group of executives representing approximately 100 New York corporations, is holding its annual meeting in New York this week amid events that call into question its very existence.

The organization, which sprang up just more than two years ago, once promised to represent the voice of corporate personal computer managers nationwide, as Share and Common do for IBM mainframe users.

Regional branches of the organization formed in the Midwest, Boston, Dallas and Minneapolis. MMA President Alan Gross was talking of forming an umbrella organization that would speak for microcomputer managers nationwide.

Such a group was formed by microcomputer managers early this year, but it's not a national MMA.

The group calls itself Technology Advancement through Strategic Cooperation (Tasc), and one of its first acts was to put some distance between itself and the MMA, which it said was more interested in antagonizing vendors than cooperating with them.

Gross denies that the MMA of New York is taking an antagonistic pose. The MMA did, however, issue a white paper to software publishers at a personal computing trade show in New York this summer. The paper called for site licensing and an end to copy protection, two things large software publishers have been loath to provide.

Tasc accepts vendors as members and, according to Tasc President Robert Corr, sees itself as embodying, in its cooperativeness with vendors, the spirit

Continued on page 86

■ Microsoft plunges into the network applications arena with a version of Word tailored to run on most IBM Personal Computer local-area networks/**80**

■ Continuing stream of network applications is predicted/**81**

INSIDE

Software/**78**
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■ **The ORACLE Application Development Center** provides a PC-based development center for the creation of DB2 and SQL/DS applications. The flexibility of the personal computing environment is made available to programmers creating applications for use with IBM's relational database products.

■ **The ORACLE Personal Information Center** extends the Information Center concept to the Personal Computer. ORACLE's application generator, graphics, spreadsheet and other end-user tools provide a SQL/DS and DB2 compatible Information Center on the desktop.

Users can become acquainted with the facilities and power of the Information Center in the personal computing environment, and transfer their knowledge and skills as the MIS Information Center facility evolves. The ORACLE Personal Information Center provides the facilities for MIS to develop the cooperative relationship with end users so vital to the success of the Information Center.

In addition, with ORACLE on departmental superminis, users can create identical Information Centers at the department level.

■ **The ORACLE Distributed Information Center** provides an intelligent set of communication links among multiple systems, with ORACLE running on IBM mainframes and various minis and PCs.

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ORACLE is currently installed on over 1000 supermini and mainframe systems around the world, as well as on thousands of PCs and compatibles. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and many government agencies.

For further information, contact Oracle Corp., Dept. C, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350.

Harris micro compatible with IBM

Harris Business Information Systems/Lanier Business Products, Inc. in Atlanta introduced its first IBM Personal Computer-compatible microcomputer.

The Concept 2000 is based on the Intel Corp. 8088 microprocessor chip running at 4.77 MHz. The product runs the Microsoft Corp. MS-DOS 2.11 operating system and uses the Phoenix Software Ltd. basic I/O system.

The basic configuration includes 256K bytes of memory, reportedly expandable to 512K bytes on the motherboard without using expansion slots. The board includes two serial ports, one parallel port and a real-time clock with battery backup.

The system is available with dual floppy disk drives or one floppy and one 10M-byte Winchester drive. A 14-in. color or monochrome monitor is included.

Later product offerings will allow users to interface with other operating systems and communicate on the Harris/Lanier Concept 6000 office automation network, according to the vendor.

The Concept 2000 is priced at $2,895.

McDonnell Douglas unveils analyst aid

Software designed to aid systems analysts in the preparation of data flow diagrams has been introduced by McDonnell Douglas Professional Services Co., which is located in St. Louis.

The Prokit-Analyst software reportedly runs on the IBM Personal Computer XT or AT and uses structured analysis techniques to create a data base for software systems design.

The software permits analysts to draw and edit data flow diagrams while the system produces and updates an applications directory at the same time.

Dictionary analysis

The product reportedly provides dictionary analysis and documentation, with automatic creation of the applications data dictionary.

It also offers full integrity checking, under which it enforces standard rules on the user as the user creates and updates data flow diagrams.

With Prokit-Analyst, reports may be generated that include all necessary data dictionary listings as well as the definitions of the relationships of symbols and warnings of imbalance conditions within a diagram, the vendor said.

Those reports also relate the entries in the dictionary to the data flow diagrams, according to the vendor.

The software will operate in conjunction with a mouse and requires a color graphics interface board. It is priced at $2,450.

SOFTWARE

■ **Syscomp has announced a software program that reportedly allows users of Lotus Development Corp. Symphony Release 1.1 to access up to 4M bytes of virtual memory without expanded memory boards.**

VMSYM runs on the IBM Personal Computer, Personal Computer XT and Personal Computer AT running PC-DOS 2 or higher. The product switches data between the computer's conventional memory and its fixed disk or a device simulating a fixed disk. It requires 640K bytes of memory.

VMSYM is priced at $75, the vendor said.

Syscomp, Suite 210, 8825 Aero Drive, San Diego, Calif. 92123.

COMMUNICATIONS

■ **Quadram Corp. has introduced its Quad3278 gateway board, a micro-mainframe communications board for local-area networks.**

Quad3278 reportedly offers a link between local-area-network-based IBM Personal Computers and mainframe hosts based on the IBM Systems Network Architecture.

It supports PU Types 1, 2 and 3 communications and emulates an IBM 3274 Model 51C/61C remote communications controller. It also provides for IBM 3278-type display emulation and offers four-color IBM 3279 emulation and IBM 3278 printer emulation.

The Quad3278 reportedly includes 512K bytes of memory and the National Semiconductor Corp. 32016 microprocessor. It is sold in three versions, offering support for eight, 16 or 32 logical units on a local-area network. The versions are priced at $4,529, $4,983 and $5,742, respectively.

Quadram, 4357 Park Drive, Norcross, Ga. 30093.

■ **Bellsoft, Inc. has announced an enhanced version of Pop-Up Telecomm communications software for the IBM Personal Computer, Personal Computer XT and 3270 Personal Computer using a Hayes Microcomputer Products, Inc. modem or compatible equipment.**

Version 1.5 includes an enhanced Pop-Up modem component that is said to support modems transmitting at 2,400 bit/sec. and to provide direct

Continued on page 81

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Microsoft launches first net application package

By Eric Bender

BELLEVUE, Wash. — Microsoft Corp. late last month rolled out its first network application, a version of the Microsoft Word word processing package that runs on most IBM Personal Computer local-area networks. The move by the second-largest independent microcomputer software vendor will help accelerate the trend toward micro networks, analysts and vendors agreed.

Available Sept. 15 for $1,195, Microsoft Word for Networks establishes licensing practices that suppliers will follow for future network applications, product manager Charles Stevens said.

The basic package includes software and manuals for five network nodes, with pricing set at three times the single-user price, Stevens noted. Microsoft Word for Networks will be sold through the company's key dealers, who will be able to split open the five-node package for customers who want to install the software on more than five but fewer than 10 workstations, he said.

Not copy protected

Unlike the single-user versions of Word, the network software is not copy protected, Stevens said. Microsoft dropped copy protection because "it degrades performance of the product on the net and inconveniences users," he explained.

The company chose Word for its first network application because "it's one of our major products, and there was a lot of demand," Stevens said. "Word naturally lends itself to a networking environment" with one prime feature being support for the laser printers that many users want to share on a network, he maintained.

Microsoft, which expects 30% to 50% of business micros to be networked within the next couple of years, currently is evaluating the market potential for network versions of Project, Chart, Multiplan and others among its offerings, Steven said.

The Word package is "the first word processor that really tries to take advantage of a network," he said. Both style sheets, which can save formats and automatically apply them to varied documents to give them a standard appearance, and glossaries, which allow users to store frequently used boilerplate text, can be shared among various users in a work group.

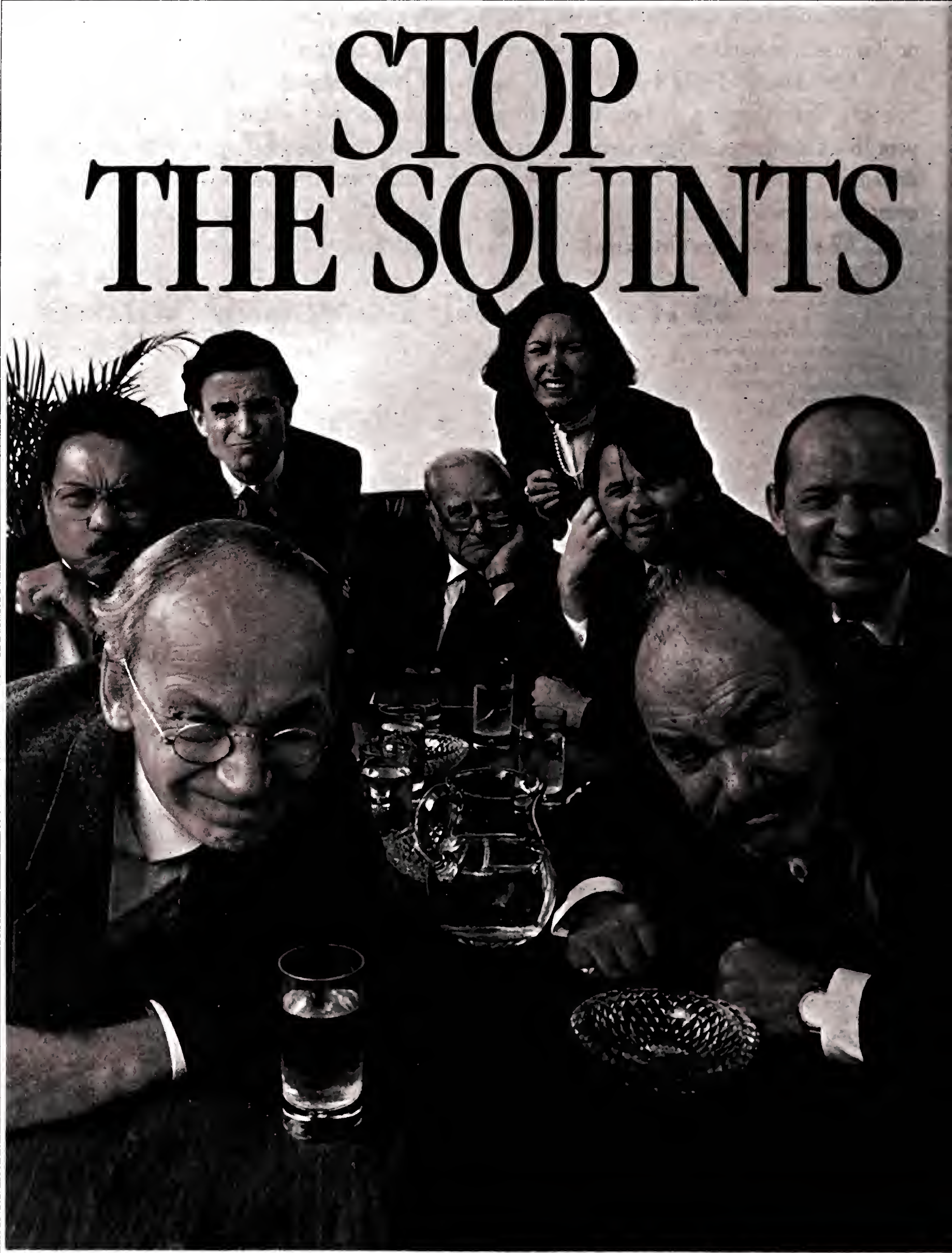
Tracor Applied Sciences, Inc. in Rockville, Md., which installed a beta copy of the program on a Corvus Systems, Inc. Omninet, has been very pleased with the overall results, according to technical editor Michael Kleinbeck. Acting as a contractor to the Naval Electronic Systems Engineering Activity, Tracor found the style sheet and glossary features particularly useful, Kleinbeck said.

"Dealing with the government, you're dealing with very rigid style formats," he pointed out. Once the styles are created on the network, new users automatically print out documents in the proper formats. Glossary functions prove useful because of the government's fondness for long titles and obscure acronyms, he added.

The ability to move to a network version was one critical requirement when Tracor began talking with Microsoft about standardizing on Word 1½ years ago, Kleinbeck said.

Word for Networks will run on the IBM PC Network, other networks compatible with the Microsoft Networks system software or on existing networks supplied by AST Research, Inc.; Corvus Systems; Fox Research, Inc.; Nestar Systems, Inc.; Novell, Inc.; Orchid Technology Co.; 3Com Corp.; and Ungermann-Bass, Inc.

The program supports file locking, either through MS-DOS 3.1 routines or through network software in existing MS-DOS 2 networks, Stevens said. Network print spooling and print job separation also are supported. The software



may be installed multiple times on a file server, so that the server may be reorganized or repartitioned any number of times.

A spelling checker permits the creation of specialized dictionaries shared among all users or dedicated to an individual user. A mail merge facility can draw data from a common mailing list on popular data base management programs like Ashton-Tate's Dbase III and Dbase II or Microrim, Inc.'s R:Base 5000 and R:Base 4000, Microsoft said.

The package requires PC-DOS or MS-DOS 2 or higher and a file server with a hard disk drive. Each workstation must be equipped with 256K bytes of random-access memory, with 320K bytes recommended, but a disk drive is not required.

Existing Word users with at least three copies can upgrade to the network version for $395.

■

String of vendors unveiling net tools

With its introduction of Word for Networks, Microsoft Corp. has joined a string of micro software vendors that are announcing network packages, industry observers noted. Among these, another major supplier, Multimate International Corp., began shipping net versions of its word processing software late in July.

Now that Microsoft has moved into net applications, "we may see others get off their duff and do something," predicted Paul Cubbage, senior industry analyst at Dataquest, Inc. "The big question mark is [Lotus Development Corp]."

Another key player is Ashton-Tate, which promised a network version of its best-selling Dbase III package when the software debuted in July 1984, Cubbage said. "I'd be surprised if that didn't come out pretty soon," he added.

Cubbage downplayed the risks of piracy for the unprotected Microsoft Word for Networks. "I don't think it's going to be a significant problem," he said. "Corporate people pretty well understand what stance they ought to take."

Bill Krause, president of 3Com Corp., a Mountain View, Calif., network supplier, called Microsoft Word "an important step in the right direction." However, Krause said, the availability of network multiuser data base managers and general business applications, such as accounting packages, is more crucial to the acceptance of networks.

"Over the next three to six months, there will be an ongoing series of announcements from virtually all the major players for multiuser network software," he said.

Continued from page 78

connection support up to 9.6K bit/sec. It also includes Xmodem error checking data transfer protocol, emulation of Digital Equipment Corp. VT100 and VT52 terminals and support for automatic logon scripts.

The new version of Pop-Up Telecomm requires IBM PC-DOS 1 through 3.1 and is available for $79.95. Pop-Up Deskset Plus Version 1.5, which includes Pop-Up Telecomm 1.5 as well as a calendar, two calculators, disk file utilities, alarm clock and a text and file editor, is priced at $129.95.

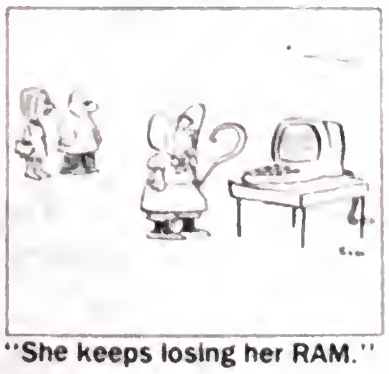
Bellsoft, 2820 Northrup Way, Bellevue, Wash. 98004.

BOARD-LEVEL DEVICES

■ **Ten X Technology, Inc. has announced an expander board and software system that is said to allow the IBM Personal Computer XT and AT to run Texas Instruments, Inc. Business Computers minicomputer software programs.**

The X-Porter system consists of a board with the TI TMS99000 microprocessor and 512K bytes of local random-access memory (RAM) and TX10 software that emulates the TI DX10 operating system. The system reportedly supports most of the 10,000 applications software

Continued on page 84



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In performance, it's the heads-up winner. Electrohome's Vari-Focus Control allows simple optical focusing on screens from 5' to 14' diagonal – using only 3 handy knobs on the back of the unit. This exclusive Electrohome feature makes the ECP 2000 the easiest-to-set-up color projection system available today.

Electrohome's single lens system automatically converges colors within the unit to project a crisp, clear, consistently brilliant color image of all data/graphics and video. In fixed or portable applications, difficult, time-consuming set-ups and focusing are a thing of the past.

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There are many other eye-opening differences that set the ECP 2000 apart from all other color projection systems on the market. For example, the ECP 2000 offers a 1,000 line lens and displays 1024 × 1280 pixels.

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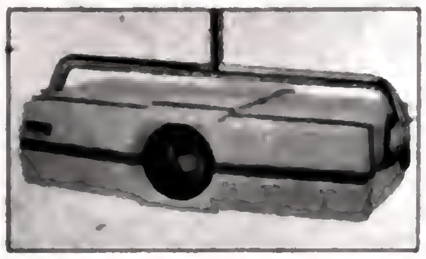

But the best way to judge the ECP 2000 is to see it for yourself. For more eye-opening information on how to Stop the Squints with the ECP 2000, the CAD/CAM 2000 for ultra-high resolution terminals operating at 30 - 65 KHz, or the EDP-58 monochrome systems, send your business card to:
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To find out more about the Networking capabilities of System 85 and System 75, call your AT&T Information Systems Account Executive or 1-800-247-1212.

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Continued from page 81

programs for TI minis on the micro.

The X-Porter is compatible with DX10 Release 3.3 or higher, except for programs that read or modify DX10 data structures, programs that directly access TI Business Systems interfaces and programs that use the TI 990/12 extended instruction set.

The product requires 256K to 512K bytes of memory, the XT running PC-DOS 2.1 or the AT running PC-DOS 3 as well as one full-size slot and a 10M-byte hard disk (or larger, depending on the software application). A communications link is required to port the application from the TI Business System to the micro.

The cost of X-Porter is $2,825.

Ten X Technology, Suite B14, 3933 Steck Ave., Austin, Texas 78759.

■ **CXI, Inc. has announced a memory board that is said to expand random-access memory (RAM) of the IBM Personal Computer and Personal Computer XT by up to 256K bytes.**

The Memory/Plus board is designed for use with CXI's 3270 PC coaxial connection, 3270 remote connection, 3278/79 Plus remote connection and 3278/79 Standard remote connection. The board reportedly allows these products to address memory above the 640K-byte limit of the DOS operating system.

The Memory/Plus board is said to provide 256K additional bytes of RAM on the IBM Personal Computer, 192K additional bytes on the Personal Computer XT and 128K additional bytes on the Personal Computer XT with the IBM Enhanced Graphics Adapter. The product is reportedly organized in four 64K-byte memory blocks, which can start on any 64K-byte boundary up to 896K bytes.

The Memory/Plus board is priced at $395 and is available for $200 when purchased with supporting CXI products.

CXI, 3606 W. Bayshore Road, Palo Alto, Calif. 94303.

■ **Emulex Corp. has announced a monochrome display adapter card with an optional printer port for the IBM Personal Computer, Personal Computer XT and AT.**

The Persyst Mini-Mono Card is said to fit in a Personal Computer XT short slot or full-size slot in the Personal Computer or Personal Computer AT. It reportedly provides 80-char. by 25-row display, uses 4K bytes of main memory and performs direct memory access operations directly to or from the display memory.

The optional parallel port reportedly supports either Centronics Data Computer Corp. or Dataproducts Corp. printer interfaces.

The cost is $225 for the standard product and $250 for the printer port model.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

■ **Alloy Computer Products, Inc. has announced an add-in memory board for AT&T's Unix PC personal computer.**

The RAM-73 board is said to allow users to add 2M bytes of expansion random-access memory to the Unix PC. The memory is built on a plug-in card that requires one slot in the computer.

The board costs $1,495.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, Mass. 01701.

■ **Applied Reasoning Corp. has introduced PC-Elevator, a board for the IBM Personal Computer and Personal Computer XT that reportedly upgrades those machines to the performance level of the IBM Personal Computer AT.**

PC-Elevator is said to incorporate the Intel Corp. 80286 microprocessor and either 512K bytes or 1M byte of on-board memory. Also included is the software for its basic I/O system.

The product costs $1,695 with 512K bytes of memory. With 1M byte of memory, it costs $2,495.

Applied Reasoning, 84 Sherman St., Cambridge, Mass. 02140.

■ **AST Research, Inc. has introduced Colorgraphplus, a graphics adapter board for the IBM Personal Computer.**

Colorgraphplus is compatible with all software written for the IBM 4910 color adapter and occupies one expansion slot, according to the vendor. It offers two modes of display: alphanumeric and all-points-addressable graphics.

In its base configuration, the board reportedly provides up to 16 colors in its medium resolution mode of 320 by 200 pixels and up to four colors at high resolution, 640 by 200 pixels.

Colorgraphplus is priced at $295.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

■ **Phoenix Computer Products Corp. has introduced an Intel Corp. 80286-based add-on board that reportedly increases the processing speed of the IBM Personal Computer, Personal Computer XT and compatible machines to exceed that of the Personal Computer AT.**

Pfaster286 uses coprocessor technology to speed up the data processing power by allowing the Intel 80286 processor to function as the system CPU, the vendor said. The product reportedly allows users to switch to native Intel 8088 mode without having to reboot the machine.

Pfaster286 costs $2,395. The 80287 option costs $350, and each additional 512K bytes of random-access memory is $400, according to the vendor.

Phoenix Computer Products, Suite 220, 1416 Providence Highway, Norwood, Mass. 02062.

■ **STB Systems, Inc. has announced an adapter board said to extend the graphics capabilities of the IBM Personal Computer, Personal Computer XT and AT.**

Continued on page 86

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MICROCOMPUTERS

From page 77

HP offers Laser Jet Plus in high-end printer mart

vent the capacity constraints of HP's plug-in font cartridges.

The combination of improved print quality and additional performance features makes Laser Jet Plus particularly suitable for high-end commercial applications such as office typesetting, technical word processing, presentation graphics and computer-aided design and manufacturing output, Archibald said.

Laser Jet Plus runs the same software as its supplier's original model and is compatible with an assortment of both HP and non-HP microcomputers.

Shipments of the enhanced printer, which costs $3,995, start immediately.

Continued from page 84

The one-slot Colorific board works with the standard IBM color monitor. With appropriate software, the Colorific supports high-resolution display modes of 640 by 200 pixels in four-color mode and 320 by 200 pixels in 16-color mode.

The board offers 16K bytes of memory for standard graphics and text display and 32K bytes of memory for extended graphics display.

It includes an IBM Printer Adapter-compatible parallel port. The Colorific is bundled with Resicorp's PC Accelerator software, which provides drivers for the extended graphics display of Lotus Development Corp.'s 1-2-3 and Symphony and Ashton-Tate's Framework files.

The Colorific costs $275.

STB Systems, Suite 125, 601 N. Glenville, Richardson, Texas 75081.

AUXILIARY EQUIPMENT

■ **Assimilation, Inc. has announced a full-function numeric keypad and input device for the Apple Computer, Inc. Macintosh.**

Numeric Turbo reportedly combines a full-scale numeric keyboard with the vendor's Mac Turbo Touch track ball cursor controller to be used in place of a mouse. It attaches to either side of the main keyboard with velcro strips for both right-handed and left-handed operators.

The device is reportedly compatible with most Macintosh software, including Lotus Development Corp.'s Jazz and Microsoft Corp.'s Excel. It is also compatible for network use.

The cost of Numeric Turbo is $149.

Assimilation, 485 Alberto Way, Los Gatos, Calif. 95030.

■ **Sola, a unit of General Signal, has released power conditioners for personal computers.**

The Personal Computer Power Conditioner (PCPC) portable plug-in unit is said to protect personal computers, small office computers and sensitive peripheral hardware from all ac power problems except total line failure.

The unit combines voltage regulation and isolation and operates as a portable dedicated line, according to the vendor.

There are two models available. The $119 PCPC 150 handles 150 kVA (1.25A).

The PCPC 300 was designed for larger personal computers and handles 300 kVA (2.5A), according to Sola. It costs $149.

Sola, 1717 Busse Road, Elk Grove Village, Ill. 60007.

From page 77

Will MMA, Tasc join forces?

behind such mainframe users groups as Share and Common.

Today, the MMA of New York — the original chapter and still the largest — sits at a crossroads.

Many of those who formed Tasc are MMA members, and although the MMA says a dual membership can be held, members of MMA chapters outside of New York may switch their allegiance to the upstart.

Were that to happen, the MMA of New York might find itself isolated, speaking only for that city's micro managers and lacking the authority that comes from sheer size of membership.

As for the vendors, they apparently are throwing their weight behind Tasc. At a recent Tasc meeting in Detroit, which drew representatives of microcomputer management from some of the nation's largest firms, Lotus Development Corp. reportedly gave attendees a preview of the new release of its 1-2-3 spreadsheet.

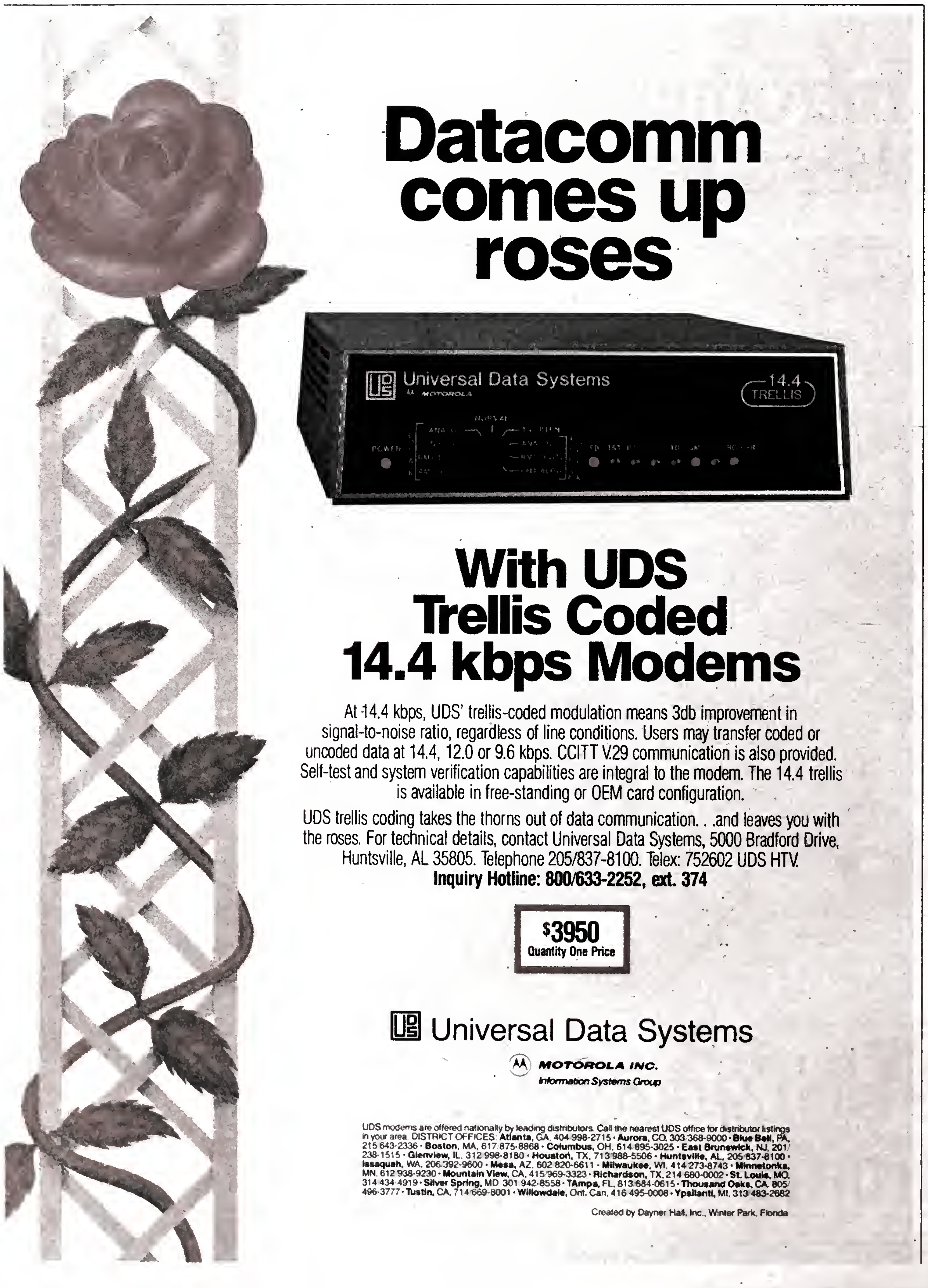
By contrast, the MMA's Gross reported just three weeks ago that he had not yet found a speaker to deliver the keynote speech at Tuesday's Microforum, the MMA's annual gathering. The MMA had hoped to get John Opel to speak, but the IBM chairman declined.

With both vendors and former or potential members joining the ranks of Tasc, the MMA is faced with a difficult situation. It could, as Gross recently suggested, become an organization that speaks for the major corporations in New York. To do so, however, would be to confine the MMA's fine sense of feistiness to one region — one that vendors could more easily ignore.

A better approach would be for the MMA of New York to become affiliated with Tasc and to speak as part of a unified voice of microcomputer managers nationwide, while retaining its name and chapter autonomy.

Such a union would give Tasc a base of members in the city that likely has the most corporate personal computer users. True, those MMA members are a contentious lot, but having a few more devil's advocates around the house can't hurt Tasc.

With the MMA at its side, Tasc could become the truly nationwide corporate personal computer users group that members of both organizations have been long awaiting.



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COMMUNICATIONS

WIRETAP/DANIEL MINOLI

How to choose the proper financial model

THIRD IN A THREE-PART SERIES

To do his job well, a communications manager must know how to purchase the right equipment. Financial models can help to make these decisions.

Sophisticated financial models have existed for a long time. The need for them was somewhat less evident when communications equipment was relatively inexpensive or when equipment lasted from 8 to 15 years. Today, equipment may well be obsolete by the time it is shipped and before it is installed.

In my past two columns, I presented key factors in the decision-making process. Next, I will present four techniques that for capital budgeting.

Generally, this is the best of the four methods listed. The first step involves calculating the net cash flow generated by a project. The net cash flow starts with project revenues and subtracts expenses other than depreciation, capital expenditures and taxes. Taxes are calculated by using the tax rate applied to revenues and by subtracting all project expenses, including depreciation.

The net present value is the sum of the present value of all future cash flows, minus the initial cost. A positive net present value means that the project yields a rate of return exceeding the cost of capital; a negative net present value means that a project earns less than the rate of interest from a bank.

There are two ways to use this method. In an accept-reject decision, the project is selected if the net present value is positive; the project is not undertaken if the net present value is negative.

The second method involves mutually exclusive alternatives, such as buying either modem A or modem B. If the net present values of both alternatives are positive, then select the one that has greatest net present value.

The internal rate of return method gives a rate of return on a project. If the rate of return exceeds the cost of capital, then the project is selected. If the internal rate of return does not exceed the cost of capital, then the project is not selected.

Internal rate of return can be explained by the following scenario. A manager has $1. This money, if put into the intended project, will earn cash at various times. If the rate is low, the project should not be accepted because a bank could easily

Continued on page 93

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

Firm launches E-mail micro

American Teleprocessing Corp., located in Houston, has announced a personal computer designed for users of electronic mail services.

The ATC 100 features two 360K-byte disk drives, 256K bytes of random-access memory, a monochrome monitor, communications software and an Okidata Corp. 182A printer.

The product works with communications products from MCI Communications Corp., Western Union Co. and TRT Data Products. The ATC 100 classifies and

Continued on page 93

Net management aid debuts

Monitors 512 modems

Anderson Jacobson, Inc. of San Jose, Calif., has become the latest vendor to enter the rapidly growing network management field. The company's Modem Diagnostic and Test System monitors and controls up to 512 four-wire lease-line modems.

The product supplies wraparound boxes that work with modems transmitting data at speeds between 1,200 and 14.4K bit/sec.

The system monitors 10 Electronics Industries Association leads, two analog signals and two auxiliary inputs. It also records network performance and can help to restore line problems.

Users can define operating thresholds and set alarms for conditions such as analog carrier level, the number of signals on an RS-232 interface and the presence of a streaming condition in a modem. These operating thresholds may be checked, changed and managed centrally for up to 256 modems.

The product consists of an IBM Personal Computer, system software and wraparound boxes.

Prices range from $4,195 to $14,480 for the central controller and are $895 for the wraparound boxes.

Boeing instrumental in creation of new users group

Exec sees TOP as companion protocol to GM's MAP

By Jeffry Beeler

SAN FRANCISCO — Boeing Computer Services Co. (BCS) has gained approval to take the lead in supporting an infant users group that seeks to promote communications standards for offices and factory floors.

On Aug. 20, company President Robert Dryden formally okayed a proposal for BCS to spearhead the cooperative development of the emerging Technical and Office Protocols (TOP) users group.

The announcement of Dryden's blessing came here on Aug. 26 at the annual Integrated Information Technology Conference and Exposition (Intech).

Dryden's decision will permit selected Boeing employees to take time off to serve on TOP's subcommittees and serve as liaisons between group members and standard-setting bodies, according to BCS manager Laurie Bride.

To increase the TOP users group's chances of success, BCS will bear most of the burden of shepherding the organization during its critical formative stages. "Boeing will lead formation of TOP, set up a TOP task force and technical review committee, and we will be the focal point for collection and dissemination of TOP information," Dryden said at Intech.

But in roughly a year, the company will gradually begin to "step back from some of its [leadership] duties and let some of TOP's other member companies start to carry the ball," Bride said.

Currently, most of the TOP organization's membership are users of the Manufacturing Automation Protocol (MAP), which General Motors Corp. developed and adopted as a standard for interconnecting incompatible factory floor devices. In other words, TOP's membership today is composed mainly of representatives from the manufacturing sector, according to Bride.

But despite its great size, the manufacturing sector by itself is probably too small to create sufficient market demand to persuade vendors to develop products that conform to TOP specifications. In the future, the TOP users group will seek to broaden its membership base beyond the manufacturing arena to include representatives of service-oriented industries like banking and insurance, Bride said.

"No vendor can afford to ignore a demonstrated marketplace," she said during an interview at Intech. "We [BCS] can't demonstrate it by ourselves, but we can do so in concert with a lot of other users."

Bride describes TOP as a BCS-developed "companion protocol to MAP" and envisions it as a communications standard that will do for offices what the GM interconnection scheme has already done for factories. If the BCS-led users group succeeds in diversifying its membership, TOP may someday emerge as a common protocol for exchanging information among competing vendors' office products, she said.

Both MAP and TOP conform to the first three levels of the seven-layer Open Systems Interconnect protocol. The third level, which defines the specifications for networking dissimilar equipment models, was added only recently and links devices in a MAP environment to their TOP counterparts.

"Addition of the [networking] capability was an important advance in the development of TOP because office workers need to have access to information on the factory floor" and vice versa, Bride said.

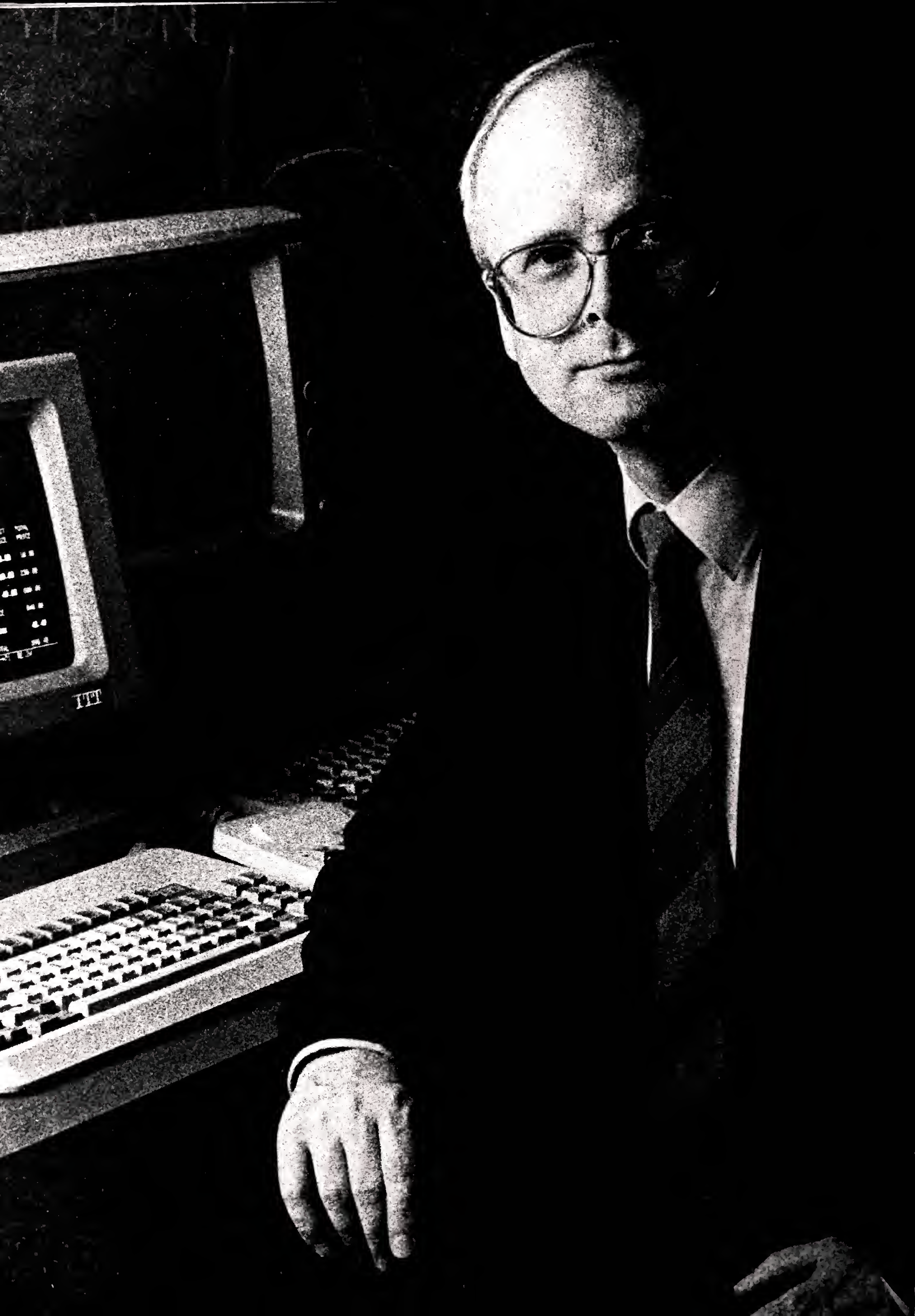
The first public demonstration of interconnected MAP and TOP environments will be jointly sponsored by GM and BSC this coming November at the Autofact '85 show in Detroit. Autofact will

Continued on page 93

- Local Data has announced a protocol converter that connects up to seven Ascii devices to an IBM System/34, 36 or 38/**90**
- T-Bar has introduced matrix switches with a nonblocked capacity of 2,048 circuits/**91**

INSIDE

Protocol Converters/**91**
Multiplexers/Modems/**91**
Local-Area Networks/**93**
Test Equipment/**93**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Data acquisition units bow

Data Translation, Inc., based in Marlboro, Mass., has announced two data acquisition modules. One converts analog signals to digital with a throughput rate of 800 kHz, and a second works at speeds up to 100 kHz.

Applications for the faster product, the DT5732, include seismic/geophysical analysis, vibration analysis, radar signal processing and high-speed waveform analysis.

The DT5732 is able to make real-time analog measurements, according to Data Translation.

It consists of an input multiplexer, a separate instrumentation amplifier for each channel, sample and hold and 12-bit analog-to-digital converter, the vendor said.

Output is compatible with Digital Equipment Corp.'s Q-Bus and Multibus and the bus on the IBM Personal Computer AT.

The DT216 was designed for data acquisition systems, automatic semiconductor testing, frequency synthesis and speech analysis applications. The module contains two converters that can be changed independently and are addressed sequentially, the vendor said.

The DT216 features a proprietary deglitching circuit that eliminates glitches caused by changes to input-offset binary code.

The DT5732 costs $1,995, and the DT216 sells for $695.

Local Data converter links Ascii devices to IBM systems

Local Data, Inc., headquartered in Torrance, Calif., has announced a protocol converter that connects up to seven Ascii devices to an IBM System/34, System/36 or System/38 via its native twin-axial I/O channel.

With Interlynx/5251, Ascii terminals or printers can reportedly emulate IBM 5251 or 5291 terminals or IBM 5256 printers.

The asynchronous devices can be attached directly or remotely with modems and dial-up lines.

The product supplies a two-level password-protection scheme for dial-up users. Interlynx/5251 supplies an RS-232 interface that is switch selectable as data terminal equipment or data circuit equipment.

A parallel port supports printers from Centronics Data Computer Corp. and Datapoint Corp. at transfer rates in excess of 2,500 char./sec., according to the vendor.

The protocol converter supports transmission speeds up to 38.4K bit/sec.

Interlynx/5251 supports terminals from a number of vendors including Digital Equipment Corp.; Lear Siegler, Inc., Televideo Systems, Inc. and IBM.

The product's diagnostic features include a timer that automatically restarts the unit in an unattended operation.

LEDs tell a user what station is being polled by the host and whether it is a dial-up or direct connection.

There are two models for the protocol converter. Model 1, $1,595, is nonexpandable with one serial or parallel port. Model 2 costs $1,995 and has one RS-232 port. Additional ports can be added for $550.

Bell Atlantic gets FCC nod for expansion

The Federal Communications Commission has granted Bell Atlantic Mobile Systems of Basking Ridge, N.J., permission to expand its cellular telephone service in the Delaware Valley.

The action enables the company to increase its service area by 400 sq miles in the valley so that it covers 2,400 sq miles.

New sites will be put into operation in West Rock Hill Township, Doylestown, Phoenixville and Guthriesville in Pennsylvania and in Sicklerville, N.J.

The company estimated the cost of the project would be $2.25 million. The West Rock Hill, Doylestown and Phoenixville sites are operational. The Guthriesville site will be running in November, and the New Jersey facility will be working this month.

Bell Atlantic began offering the service in July 1984 and now serves 17 sites.

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PROTOCOL CONVERTERS

■ **Wall Data, Inc. has enhanced its line of IBM 3270 and 5251 protocol converters.**

The DCF/3270 connects Ascii personal computers and terminals to IBM mainframes running 3270 Systems Network Architecture and Binary Synchronous protocols. The DCT/5251 connects Ascii devices to IBM System/34, 36 or 38 hosts.

Enhancements to the DCF/3270 and DCF/5251 enable the products to support Apple Computer, Inc.'s Macintosh's native mode, speeds of up to 19.2K bit/sec. on all ports and high-speed screen painting for personal computers and terminals.

Prices for the converters range from $3,995 to $5,995.

Wall Data, 17769 N.E. 78th Place, Redmond, Wash. 98052.

MULTIPLEXERS/ MODEMS

■ **MDB Systems, Inc. has announced a version of the Digital Equipment Corp. Q-bus DHU11 multiplexer, expandable from 32 to 256 channels.**

The product works with the DEC PDP-11/23, 11/73 and Microvax Q-bus-based systems and is compatible with DEC's RSX11 and RSTS/E operating systems.

The multiplexer's host module, the MLSI-DHU-MP, contains a 16-bit microprocessor, random-access memory files and interrupt and programmed I/O sequencers.

The module is coupled to one or more boards containing the parallel bus interconnect circuitry and 32 universal asynchronous receiver transmitters (Uarts). The Uarts convert parallel data to serial and serial to parallel for RS-232 communications with most terminals and microcomputers.

The 32-channel series with DHU11 emulation, Model MLSI-F-DHU-A32, includes the master module, one PBI-A32 board and two distribution panels with a total of 32 connectors. The price is approximately $6,500.

MDB Systems, 1995 N. Batavia St., Orange, Calif. 92665.

■ **Anderson-Jacobson, Inc. has announced the AJ 4801 modem for point-to-point or multipoint applications.**

The AJ 4801 is compatible with the CCITT V.27 standard for use over four-wire, unconditioned leased lines. The modem permits serial data transmission at 2,400 bit/sec. or 4.8K bit/sec.

The modem uses a single board and measures 2.8 in. high by 8.3 in. wide by 13.8 in. deep. The device is said to monitor and adapt to changing line conditions.

It employs digital signal processing and diagnostics, including error detection and six loop tests that can be operated centrally.

The AJ 4801 is priced at $1,495 and is available immediately.

Anderson-Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

■ **Amcom Systems, Inc. has announced a short-haul modem built inside a connector case.**

Localmodem was designed to overcome distance limitations of RS-232 connections. The modems can be used in pairs for point-to-point links and operate at speeds of up to 9.6K bit/sec. over a five-mile distance. The product can be used as either data communications equipment or as data termination equipment.

The snap-together case connects to either modular wire via a built-in RJ 11 jack or twisted pair. There are two models — one with a male connection and a second with a female connection.

Model 411 is designed for telephone company lines, employs balanced transformers to reduce cross-talk and sells for $98. Model 401 works with electronic protection circuitry and costs $76.

Amcom Systems, Suite 611, 5646 Milton St., Dallas, Texas 75206.

T-Bar introduces 19.2K bit/sec. matrix switches

T-Bar, Inc., located in Wilton, Conn., has introduced matrix switches that reportedly offer more than 17 times the nonblocked capacity of IBM's recently announced 3728 switch.

DSM Series 2001 supplies 2,048 circuits that support transmission speeds of up to 19.2K bit/sec., compared with a figure of 120 circuits for an IBM product, T-Bar claimed. The switches work with nonblocked satellite architecture, according to the vendor.

The T-Bar offering supplies up to 32,000 ports, which are compatible with various modems from AT&T and IBM, the company said.

T-Bar added that the product's control terminal can be a personal computer from AT&T, IBM, Texas Instruments, Inc. or other companies that run Microsoft Corp.'s MS-DOS operating system.

There are two versions of the product, Galaxy and Monolith. The Galaxy version supplies 2,048 ports and the Monolith version supports 320 ports.

The switches are available at an average cost of $300 to $350 per port, according to the vendor.

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From page 87

How to choose the proper financial model

match a low rate. If the rate is high, then the project should be pursued, because a bank probably could not match a high rate of return.

The internal rate of return method may not be as reliable as the net present value method for two reasons. When comparing alternatives, it may not be advantageous simply to pick the alternative with the highest internal rate of return. Also, there are projects that do not yield a meaningful internal rate of return.

The payback period is the length of time it takes to recover an initial investment. When comparing two options, the one with the shorter payback period would be selected. This method is not as good as the net present value method because it does not include cash flows beyond the payback period.

The accounting rate of return, also called the return on investment, is the average annual after-tax accounting profit generated by the investment divided by the initial expense. This method is also inferior to the net present value method because it does not evaluate cash flow or take into account the cost of money.

Although these last two methods have been used prior to the general availability of computing power being arithmetically simpler, the other methods should now be used. With micro and mainframe spreadsheet packages, one has the tools to apply the appropriate methodology.

We are now going to examine two examples of purchase decisions. First, we can either buy some equipment for $2,000 or lease it for $80 for 36 months. Assuming a revenue benefit from the new equipment of $1,800 for each of three years, a cost of capital of 10%, an amortization schedule of 36 months, a salvage value of $100, a tax rate of 50% and an investment tax credit of 8%, we find with the net present value method that the buy option is better. The net present value in the purchase case is $1,262; the net present value in the lease case is $1,044. Only when the equipment cost exceeds $2,428 does the lease option become better.

In a second example, we can either buy equipment for $2,000 and have a $100 per month maintenance fee, or we can buy it for $3,000 and have a $50 per month maintenance fee. All the other factors are the same as in the first example. In this case, the $3,000 option is better because the respective net present values are $231 and $9. Only when the maintenance on the $2,000 item decreases to $84 per month does it become the better option.

From page 87

Firm launches E-mail personal computer

saves messages that are created, sent or received.

The micro supplies multitasking capabilities that enable users to edit one message while sending a second. Documents created on an IBM Personal Computer can be transferred to the ATC 100. The ATC 100 costs $2,995.

From page 87

Boeing instrumental in creation of group

also reportedly coincide with the TOP Version 1 specification.

About one month later, the TOP users group will hold its first organizational meeting in Seattle. "We want to capitalize on the enthusiasm that will be left over from the demonstration at Autofact," Bride said.

Although the TOP and MAP users groups are expected to have their own separate executive committees, the two organizations will likely rely on a common steering committee made up of representatives from 14 member corporations. "The sharing is necessary to avoid duplication of effort and to make sure that MAP and TOP remain in step with each other," Bride said.

LOCAL-AREA NETWORKS

■ **Syros, Inc. has announced connectionless Internet Protocol (IP) software, a product that is said to conform to the International Standards Organization National Bureau of Standards Class 4 Transport Protocol.**

The software is written in C programming language and can be ported across a variety of CPU types.

IP software costs $2,500.

Syros, P.O. Box 24477, Tempe, Ariz., 85282.

TEST EQUIPMENT

■ **Atlantic Research Corp. (ARC) has announced an internal autoanswer/autodial modem for its Comstate I and Interview 40B and 30B data analyzers.**

The Comstate I, Interview 40B and 30B can be programmed with a phone number to call the user when preprogrammed conditions exist, the vendor said.

Captured data and test results can then be transferred to the receiving Comstate or Interview data analyzer by remote control, according to the vendor.

The Unattended Remote feature allows control of the analyzer from an Ascii terminal or any other ARC analyzer with terminal mode over a communications circuit.

The price for the modem option is $650.

ARC, 5390 Cherokee Ave. Alexandria, Va. 22312.

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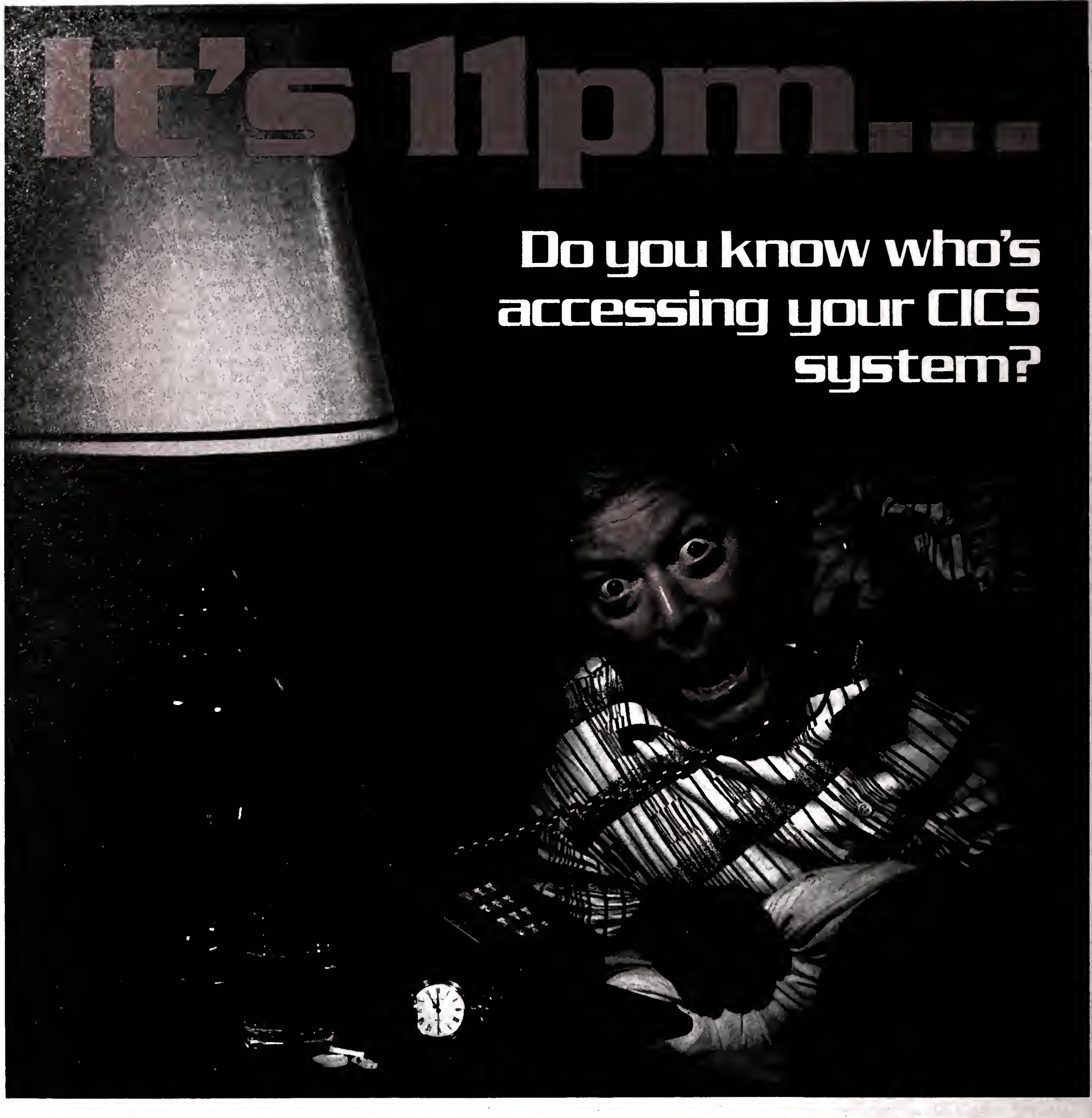
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SYSTEMS & PERIPHERALS

■ Shiva Multisystems announced a parallel system for circuit simulation/**96**

■ A blueprint for computer-integrated manufacturing implementation/**100**

■ Special manufacturing considerations enter early into computerized product design cycles/**104**

■ Intecolor announced a color graphics terminal for DEC minicomputers/**108**

INSIDE

Processors/**96**
Data Storage/**108**
Terminals/**108**
Printers/Plotters/**113**
Graphics Systems/**113**

Research, acquisitions tell Honeywell's tale

FIFTH IN A SERIES

By Tom Henkel

Like other companies that divide their attentions today between building computer systems and sophisticated electronics gear, Honeywell, Inc. made its mark on the industry partly through its own early electronics research and partly by acquiring successful computer companies.

By 1955, when Honeywell officially entered the computer business by co-founding Datamatic, Corp. in Newton, Mass., it was already a successful purveyor of electronics gear. But unlike IBM and Sperry Corp., which evolved into computer businesses largely by replacing corporate electromechanical business machines with improved electronic devices, Honeywell approached the computer industry by a less likely path.

The roots of Honeywell extend to the late 1800s and a gadget called the "damper flapper," a Rube Goldberg-like device designed by a Swiss immigrant, Albert Butz. The damper flapper's function was to manipulate the dampers on a coal-fired furnace to maintain an even room temperature and, with any luck, to keep one's home from burning to the ground due to an overly stoked furnace.

While the damper flapper itself had nothing to do with computing, it gave rise to a company that — through a somewhat circuitous route — did deal with computing. The damper flapper and its patent caused two men, Mark Honeywell and W. R. Sweatt, to merge their respective heat control companies to form the Minneapolis Honeywell Heat Regulator Co. in 1927.

Building upon the heat regulator — thermostat — business, Minneapolis Honeywell Heat Regulator branched out to manufacture various types of control systems. In 1934, Minneapolis Honeywell Heat Regulator bought out Brown Instrument Co. in Philadelphia.

Brown Instrument was one of the leading manufacturers of recording, indicating and controlling instruments. That acquisition propelled Minneapolis Honeywell Heat Regulator to a stronger dependence on electronics.

World War II bolstered Minneapolis Honeywell's interest in electronics as the company developed various instruments for the armed forces, including the C-1 electronic autopilot system.

By the early 1950s, Honeywell researchers were experimenting with Bell Laboratories transistors, a move that led to the formation of Datamatic in 1955. Datamatic was a joint effort by Raytheon Corp. and Honeywell to develop a large-scale computer system. Raytheon sold its 40% share in the company in

Continued on page 99

School district's NAS drives get high marks

Cache controllers provide IBM power at 60% of cost

By Donna Raimondi

MIAMI — The fourth largest school district in the U.S. installed one of the first National Advanced Systems, Inc. NAS 7880 disk drives with cache controllers to handle its 26G bytes of storage data. As a result, the Dade County School District is getting performance comparable to that of an IBM 3380 disk drive for 60% of the cost.

The school district serves approximately 232,000 Dade County public school students, said Management Information Systems Director Gene Brewer. The Florida legislature has mandated that all school districts transmit student information electronically to the capitol in Tallahassee by July 1, 1987. But even before the mandate, Dade's school system had been in the process of automating for seven or eight years, said Brewer.

With an annual budget of over $1 billion, $10 million of which is dedicated to MIS, the school system must track student information such as grades, attendance records, schedules and career counseling activities for grades kindergarten through 12. The district's mainframe system, a NAS 9080 processor running under IBM's MVS/SP 1.3.1 operating system, also handles all budget, financial, personnel, food services and transportation information processing for the school district.

The more than 1,500 terminal users in the state-controlled information resource network (Dade provides data processing services for school districts in two Florida panhandle counties, as well as for itself) have experienced response times of less than a second since adding the NAS 7880 disk drives with cache controllers, Brewer said. These response times, down from as much as 30 seconds, cannot be attributed solely to the cache controller feature because there have been upgrades to the whole system, he said.

The reason the school district is so heavily stocked with NAS equipment is purely based on price, Brewer said. When bids went out for computer equipment, NAS came in at about 60% of what comparable IBM equipment costs. The mainte-

Continued on page 113

Floating Point Systems adds MP32 series array processor

Targeting signal- and image-processing systems integrators and OEMs, Floating Point Systems, Inc. in Beaverton, Ore., has announced its MP32 series array processor.

The processor is said to perform up to 54 million floating-point operations per second. It is a multiple-instruction, multiple-data multiprocessor supporting up to three arithmetic processors and two I/O processors. Its internally shared memory can hold one million to seven million 32-bit words, with 24-bit addressing for up to 16 million words.

The company said that a Motorola, Inc. 68000-based control processor directs the flow of data and instructions through the system and that concurrent, asynchronous operation is facilitated by a control language similar to Fortran with utilities for handling parallel processing.

Memory reportedly can be addressed in arbitrary increments such as rows, columns and diagonals. There are nine slots for memory and processor options. There is also a switch-selectable formatter to perform fix and float operations and a 6M byte/sec. I/O processor transfer rate.

The MP32 was designed to be compatible with Data General Corp. and Perkin-Elmer Corp. computers used as front-end processors.

Available now, it is priced starting at $57,500.

SI clusters Microvax II

By Donna Raimondi

MILPITAS, Calif. — System Industries, Inc. (SI) has taken the wraps off a $4,000 interface to its 9900 controller that reportedly enables the Digital Equipment Corp. Microvax II to be clustered with up to eight VAX machines of any size on an SI 9900 series cluster controller.

The 9900 controller supports up to eight CPU interfaces when it has a $15,000 SI multiple access controller system added to it. The controller system is said to allow any machine on the cluster to act as I/O manager, eliminating the need for one machine to be a dedicated traffic manager.

A newly announced option for the 9900 controller — a disk cache controller — enables the most often accessed or selected data to be cached in the controller, allowing a 2-msec average access time as opposed to a 25-msec access time if the data had to go out to the disk.

The company also announced a product that is said to allow the Microvax II to access up to 2G bytes of storage in stand-alone mode or to directly access up to 5G bytes of storage data on a cluster. The company's QDA/50 disk controller system is a Q-bus disk adapter that allows all of Fujitsu Systems of America Winchester drives to run on the Microvax II. It is a DEC Storage Architecture-compatible option for DEC's PDP and VAX series machines, an SI spokesman said.

The QDA-50 is said to offer SI's Power-Pack configuration, which allows disks and tapes to be put in a single cabinet, and to offer a sub-20

Continued on page 113

Shiva unveils turnkeys said to speed circuit simulation

SX series based on Sequent system

A parallel system announced recently speeds circuit simulation of integrated circuit designs and is based on the Sequent Computer Systems Balance 8000 parallel computer with National Semiconductor Corp. 32032 chips.

Shiva Multisystems Corp., a 2-year-old Menlo Park, Calif., company that develops systems to address the computation-intensive problems in the computer-aided engineering industry, announced its SX series of turnkey systems.

The systems are said to be dedicated to electronic circuit simulation. The SX series operates under Sequent's Dynix operating system, a University of California at Berkeley 4.2 version of AT&T's Unix. Shiva's Powerspice circuit simulation software is included in the system.

The SX series is said to simulate performance of integrated circuits while running at speeds of up to 100 times faster than a Digital Equipment Corp. VAX-11/780 running the public domain Spice2 circuit simulation software developed by the University of California at Berkeley. The VAX-11/780 running Spice2 is a standard way to compare circuit simulation systems, a Shiva spokesman said.

The SX series can communicate via Ethernet using the TCP/IP protocol with DEC's VAX series computers running under the AT&T Unix or DEC VMS operating systems; with IBM or plug-compatibles running VM; and with AT&T Unix-based workstations, including those from Apollo Computer, Inc., Masscomp and Sun Microsystems, Inc.

Shiva plans to mix the 32032 chips with its own accelerator processors into the configuration needed to reach certain performance levels at the prices listed below.

Models include the SX-250, which is projected to have two National Semi 32032 processors and two Shiva accelerator processors. This model is said to offer 20 times the performance of a DEC VAX-11/780 running Spice2, and it costs $125,000.

The SX-1000 will most likely have six 32032s and six accelerators. It is said to offer 50 times the VAX-11/780's performance at a price of $240,000. The top-of-the-line SX-2000 costs $350,000 and will contain between eight and 12 processors and the same number of accelerators. This model is said to offer 100 times the VAX's performance.

All units will ship in October.

Study eyes optical disks

Optical disk systems will represent almost one-quarter of the value of automated document storage equipment shipments by the end of the decade, according to a study by Venture Development Corp., a management consulting firm based in Natick, Mass.

The study examined the market for image storage equipment in the U.S. and noted that the $400 million to $500 million annual market for conventional document storage and retrieval equipment, including micrographics and COM, has grown only gradually in recent years.

But the report, "Micrographics and Optical Digital Disk Systems 1985-1990," added that the market for optical digital disk systems has moved from a few test sites in 1984 to commercial shipments of $6 million for 1985. By 1990, annual shipments will be worth $160 million, the report said.

Venture Development noted that while the $160 million figure is below the estimates of some industry observers, optical systems will still represent an important market.

The report cited three prime areas of concern in relation to optical technology. It said the six-figure price tag for a complete optical disk system increases the importance of cost justification. It noted that the useful life of images stored on optical disk remains a question while microfilm images made 100 years ago are still usable today. And, it observed that if courts do not accept optical disks as legal evidence then COM backup of optical systems will be necessary for some applications.

However, the report forecast that by 1990 optical digital disk systems will represent 24.4% of the automated document storage and retrieval equipment shipments, vaulting that technology from the point of having no market share in 1984 into second place in the market behind standalone micrographics systems.

The 140-page report costs $2,970.

PROCESSORS

■ **Computervision Corp. has unwrapped a file server for engineering project management and resource sharing.**

The CDS 3701-E file server is part of Computervision's CDS 3000 family of workstations. The file server acts as a resource node on an Ethernet TCP/IP network, the vendor said. The basic unit includes a dual Motorola, Inc. 68000 central processing unit, 2M bytes of main memory, a 33M-byte 5½-in. hard disk drive, the C programming language and AT&T's Unix 4.2 BSD operating system. That system costs from $25,900.

Continued on page 108

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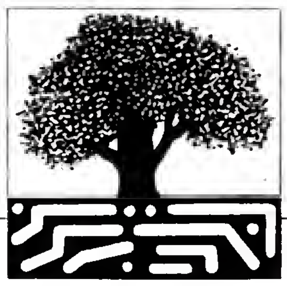
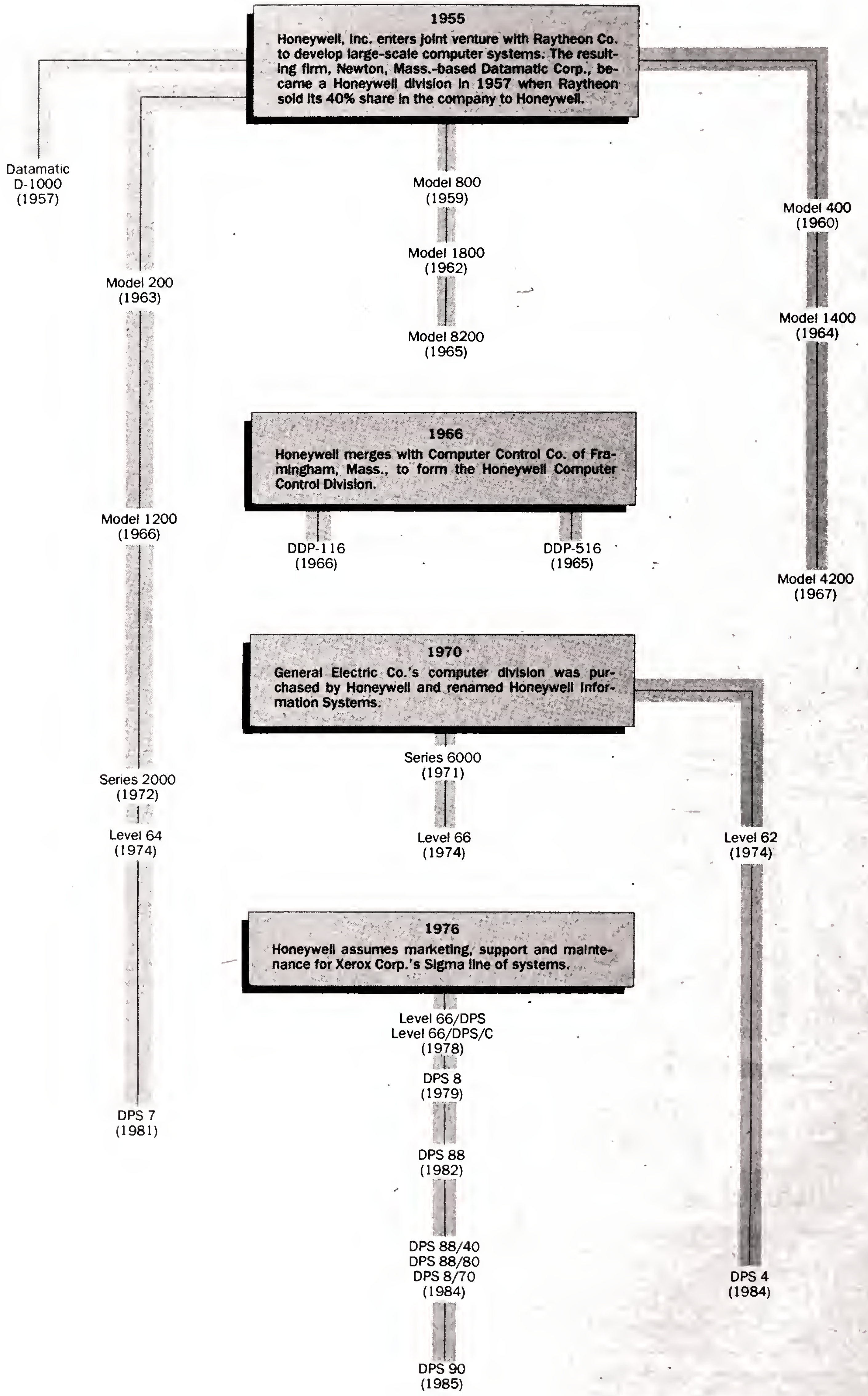


CW CHART BY MITCHELL J. HAYES

Honeywell Family Tree



1955
Honeywell, Inc. enters joint venture with Raytheon Co. to develop large-scale computer systems. The resulting firm, Newton, Mass.-based Datamatic Corp., became a Honeywell division in 1957 when Raytheon sold its 40% share in the company to Honeywell.

1966
Honeywell merges with Computer Control Co. of Framingham, Mass., to form the Honeywell Computer Control Division.

1970
General Electric Co.'s computer division was purchased by Honeywell and renamed Honeywell Information Systems.

1976
Honeywell assumes marketing, support and maintenance for Xerox Corp.'s Sigma line of systems.

From page 95

Research, acquisitions tell Honeywell's tale

1957, and Datamatic became a division of Honeywell.

The Datamatic Division produced its first system, the D-1000 in 1957, which was installed by Blue Cross and Blue Shield of Michigan. About 14 of the vacuum tube D-1000 units were installed, recalled George Olsen, now a director of quality management for Honeywell.

The D-1000 gave way to the Model 800 processor in 1959, which was superseded by the 1800 model in 1962. Also in 1962, Honeywell unveiled the Model 400, which used an innovative snake logic switch patented by a young researcher at MIT.

That researcher, Ken Olsen, was the founder and chief executive officer of Digital Equipment Corp. The Model 400 was an attempt to compete with IBM's 1400 series of processors, noted Honeywell's George Olsen.

The Model 400 was superseded in 1965 by the Model 200, which Honeywell's Olsen claims was five times more powerful than IBM's 1401.

In 1966, Honeywell acquired another company, Computer Control Co. of Framingham, Mass., which added two small 16-bit minicomputers to the Honeywell lineup — the DDP-116 in 1966 and the Series 1640 in 1970.

But by far, the most significant turn of events that propelled Honeywell into the mainframe business was the acquisition of General Electric Corp.'s failing computer business in 1970.

Honeywell called the deal a "partial purchase-partial pooling," whereby both Honeywell and GE would contribute to the formation of a new firm. The firm became Honeywell Information Services. Honeywell owned 81.5% of the company, and GE owned 18.5%.

To gain such a commanding role in the new company, Honeywell agreed to give GE 1.5 million shares of stock and $110 million in notes, interest free, for the first year. The merger led to the acquisition of Series 60 and Series 6000 processors, which have been enhanced into what is the firm's current product lineup.

In 1976, Honeywell acquired an interest in another failing computer company — Xerox Data Systems. Honeywell agreed to assume marketing, support and maintenance for the Xerox Sigma line of mainframes. Honeywell eventually developed a migration path to allow Sigma users to move to Honeywell mainframes.

> ”
>
> *But by far, the most significant turn of events that propelled Honeywell into the mainframe business was the acquisition of General Electric Corp.'s failing computer business in 1970.*

That same year, Honeywell introduced its Level 6 line, which it considered a major thrust into the minicomputer business.

The company began emphasizing distributed processing in 1977 with the announcement of its Distributed Systems Environment and an extension of that environment to the Level 68/Distributed Processing System (DPS) and the integration of host and satellite functionality with multifunctional Level 6 Gcos software.

Four large-scale computers, the DPS 8 line, and the Gcos 8 operating system were added in 1979, followed by a family of small, distributed processing systems, the DPS 6 and various word processing and administration systems a year later, marking Honeywell's entry into the office automation market.

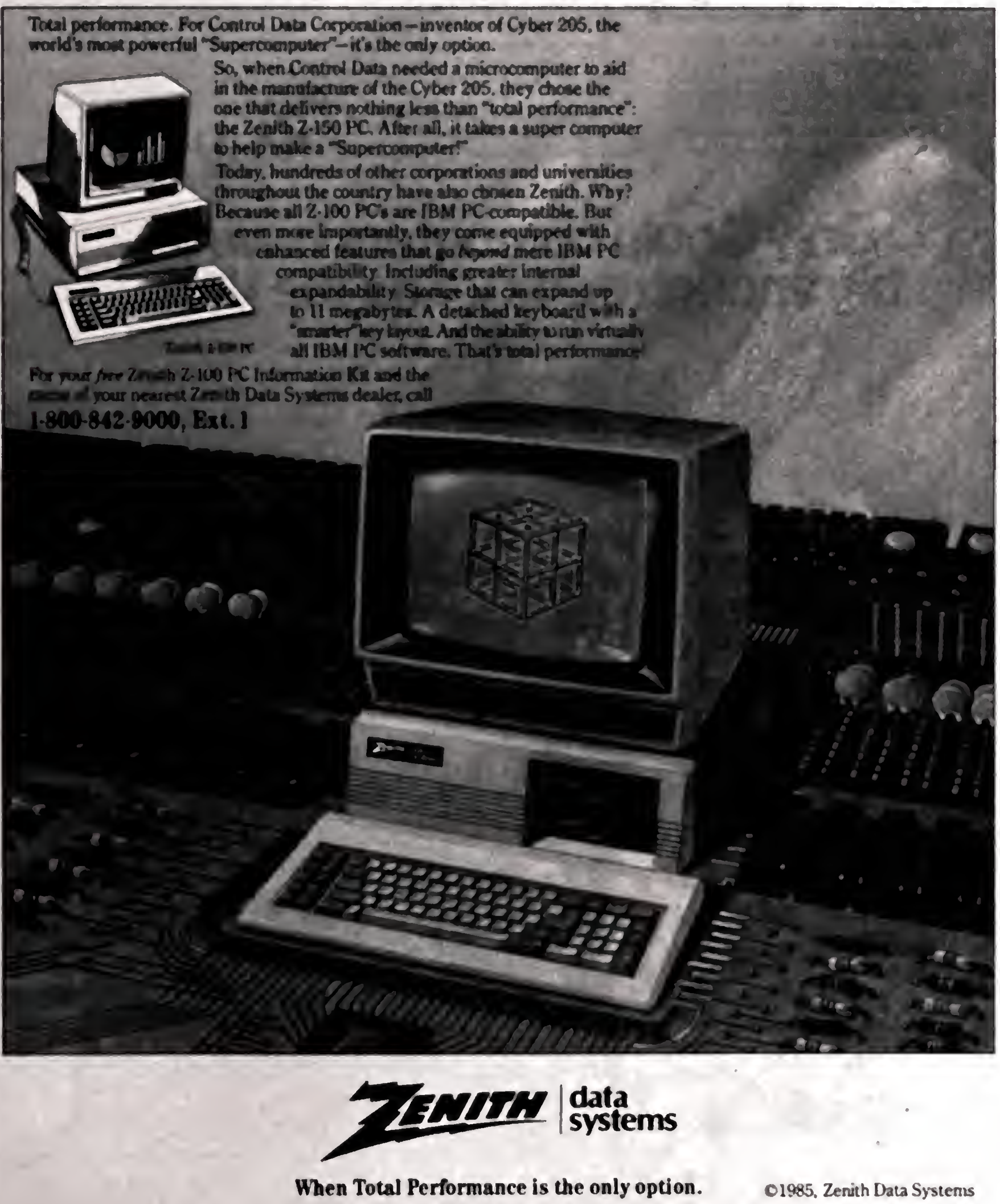
The DPS 7, a family of medium-scale systems using current-mode logic technology, was introduced in 1981. The same year, Honeywell acquired Action Communication Systems, Inc., a tandem switching and private voice network vendor, and renamed it the Communications Networks Division.

A new line of large systems, the DPS 88 family, was announced in 1982, but Honeywell shifted its attention to small systems in 1983 with the introduction of its first microcomputer, the Microsystem 6/10.

In 1984 Honeywell added to its DPS 88 series and signed a technology agreement calling for Honeywell to use NCR Corp.'s 32-bit very large-scale integrated processor chips in developing a future computer.

Earlier this year, the company added a high-end system, the DPS 90, designed to serve the commercial, engineering and scientific communities as the central system in large distributed networks.

"Fortunately, this is a problem that can be solved by throwing money at it."



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CIM: The future of factory management, automation

By Warren Hinze
Special to CW‡

Computer-integrated manufacturing (CIM), the blueprint for the future of factory management and automation, is an informational model of the manufacturing business.

To understand CIM, MIS managers must approach it from both the information side and the business applications side.

Two models — one for each side — provide some guidance.

Applications model

This model is composed of nine elements:

- Business planning.
- Resource planning.
- Resource scheduling.
- Demand management.
- Distribution management.
- Factory automation.
- Measurement and control systems.
- Configuration management.
- Financial management.

Together, these elements compose a comprehensive view of the business of factory management and automation.

Business planning encompasses the areas of market and financial planning. It uses modeling, simulations and fourth-generation computer languages to provide managers with the information they need. These tools promote the development of a feasible business plan.

Resource planning concerns plans for materials, manpower, machines and tooling. These resources must be present if an organization is to execute the business plan its managers have created.

Resource scheduling makes priorities for the consumption of resources. It addresses such questions as "What materials should the purchasing department buy next?" and "Which product should manufacturing produce next?"

Demand management encompasses three key elements: sales forecasting, customer order entry and sales tracking and analysis. Based on these, demand management provides business planners with the data they need to analyze the effects that actual and projected customer activity have had or will have on business.

Distribution management is concerned with distribution requirements planning (DRP) and transportation management.

DRP manages the movement of inventory from the factory, through the distribution system, to the customer. It also manages inventory within the distribution system, ensuring that excess inventory is properly redistributed.

Transportation management cannot be entirely separated from distribution management because the mode of transportation a firm uses affects the nature of the distribution system. Cost trade-offs between various modes of transportation, for example, determine the sizes and locations of a firm's warehouses.

Factory automation captures the imagination of many senior managers, who envision robots (serviced by automated materials handling equipment) effortlessly producing quality products at the lowest possible cost. But without business plans that are incorporated through CIM, those robots effortlessly produce high-quality, low-cost parts that no one wants.

Measurement and control systems collect data from manufacturing machines and analyze those machines' performances. The data acquisition process is beneficial because it tells managers what has happened. The analyses, however, provide the real payback: They show the effects the past is likely to have on the future. Because CIM is based in business planning, it provides the outline for the future against which managers can analyze the past.

Configuration management defines — through a series of steps — what a manufacturer will produce.

First, engineers use computer-aided design tools to define a product. Then manufacturing management transforms that data into bills of material, and computer-aided manufacturing tools transform the design into instructions for machine tools. Process planning software then identifies each work center machine cell or assembly area that will be required for the production of the product, and manufacturing resource planning systems identify actual materials and processes.

Each of these areas must be controlled to ensure that the products the engineers designed actually got produced and delivered, and configuration management within CIM provides the necessary control.

Financial management under CIM will make use of tools that analyze production performance against future plans. This will allow for more timely analysis than current practices allow.

Most companies today analyze production against financial actuals. In well-run companies, where books are closed within five days after a month's end, data is an average of 17 days out of date. In contrast, analysis

Continued on page 108

Hinze is vice-president for systems planning at Comserv Corp., an Eagan, Minn.-based supplier of manufacturing software and services.

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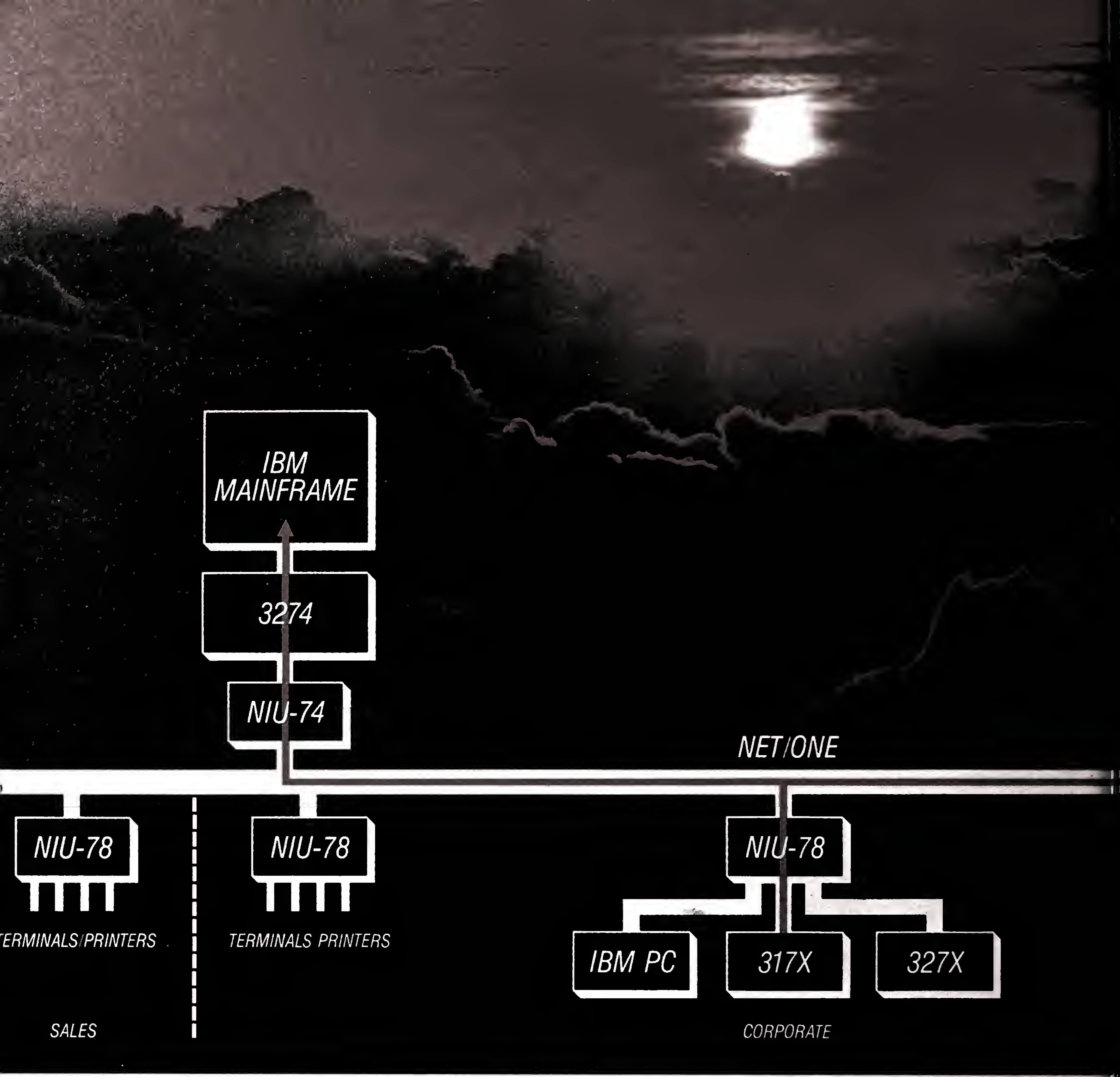

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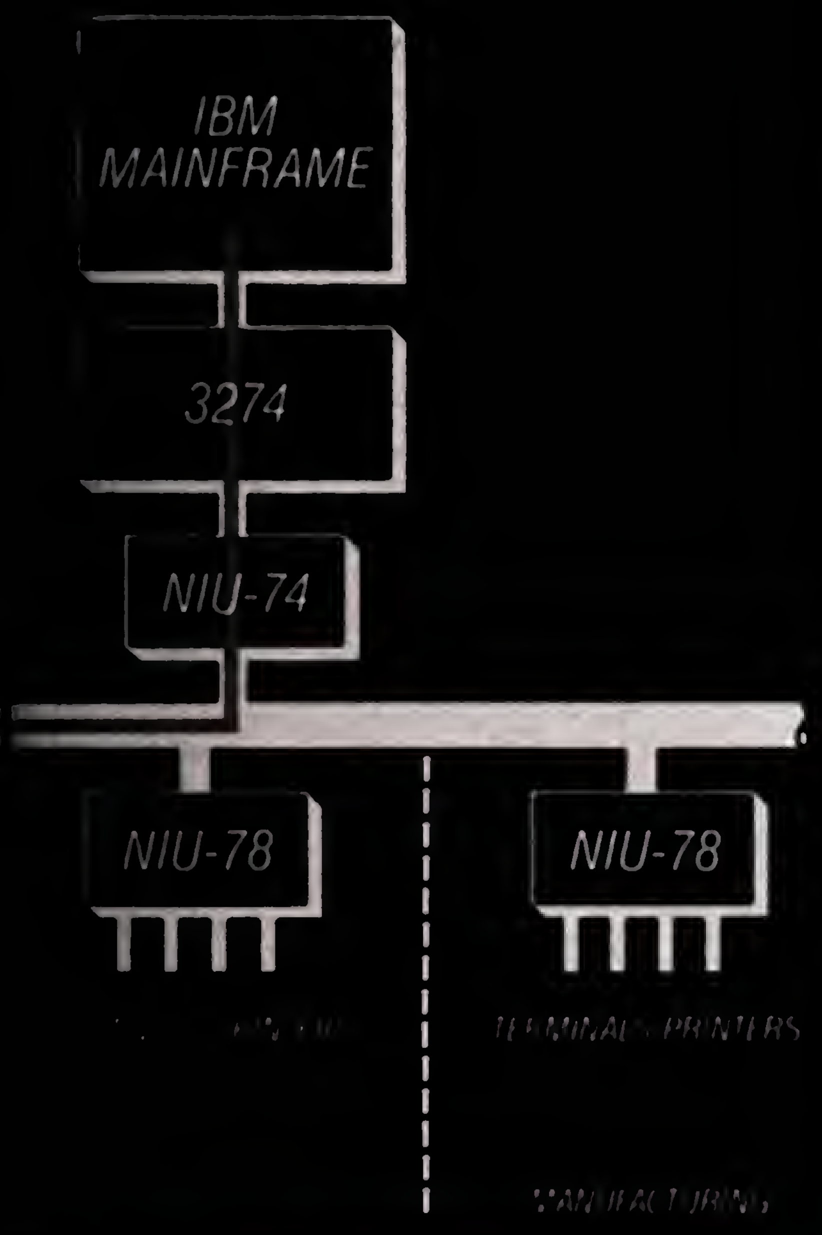

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DFM aids manufacturing priorities in design cycle

By Henry W. Stoll
and Joanne H. Cole
Special to CW‡

One of the most significant changes that has resulted from the computer revolution is the redefinition and evaluation of many job requirements into terms that a computer can understand.

In the manufacturing environment, computerized systems are actively being used in many areas. Plant operations changes have been pervasive and well publicized. Manufacturing techniques include Kanban (just-in-time) inventory control systems, modeling and simulation of operations and assembly operations, direct computer links between user and supplier, automated material handling, statistical process control and flexible machining and assembly.

Less publicized have been the advances in product design. Design engineers now use computers extensively as engineering aids. Computer-aided design and engineering, finite element modeling, dynamic simulation and solid modeling are glamorous computer applications currently being used.

Not quite so well known is the engineering concept of design for manufacture (DFM). This concept ensures that manufacturing considerations enter early into a product's design cycle. Products designed under DFM guidelines have highly standardized components, and all unnecessary, difficult-to-manufacture features are eliminated.

The DFM concept emerged from early attempts to automate simple, manual assembly tasks. Engineers found that when people performed simple assembly tasks, they were able to compensate for problems with tools or with parts they were assembling. Machines could not perform many of these operations until the material and process problems were corrected.

Management realized that many of the problems with human assembly operations occurred when nonstandard parts or operations were required. DFM minimizes these nonstandard components and operations within the manufacturing and assembly process.

Consider manufacturing early

DFM stresses that seemingly insignificant decisions made during the initial design phase will affect manufacturing throughout the product's life cycle. Most products can be designed for easy manufacture and assembly if manufacturing is considered early in the design process. The DFM concept seeks the following goals:

- To choose product design concepts that are inherently easy to manufacture.
- To choose component designs for ease of manufacture and assembly.
- To integrate manufacturing process design with product design to assure manufacturing process capability.
- To eliminate component or assembly features that disrupt the smooth flow of production.
- To add component or assembly recognition or fixturing features to aid manufacture and assembly.
- To maximize simplicity in components and operations.
- To maximize design commonality among similar products and differentiate among products as late in production as possible.
- To match the production system to the product in an optimal way.

Several important techniques are becoming available to provide assistance in DFM. A numeric system for rating the assembly efficiency of a product design was developed in 1983 by Geofrey Boothroyd and Peter Dewhurst, professors at the University of Massachusetts, Amherst, Mass.

This system, based on time studies of assembly operations, rates an assembly based upon the number and configurations of component parts required. It is available in both handbook and computer software versions. The system can also be used to identify the appropriate assembly operation (such as manual, flexible automation, hard automation and others) based upon expected production volumes and company investment criteria.

Many consulting companies have also recognized the importance of DFM and are now providing assistance in this area.

A number of companies have successfully implemented DFM programs. DFM techniques resulted in significant design changes for the Apple Computer, Inc. Macintosh, Sony Corp. Walkman, Hewlett-Packard Co. 9000 line of desktops, and Whirlpool Corp. and General Electric Co. appliances. Although these companies are very large and produce high volumes of assemblies in highly automated facilities, the principles and benefits of DFM do not depend on

Continued on page 113

The authors work in the Flexible Inspection and Assembly Laboratory at the Industrial Technology Institute, a consulting firm in Ann Arbor, Mich. Stoll is manager of design for manufacture; Cole is a senior staff engineer in the flexible inspection systems group.

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IBM ON TELECOMMUNICATIONS

Q. IF A MODEM IS A MODEM IS A MODEM, DOES IT REALLY MAKE A DIFFERENCE WHICH ONE I BUY?

A. The fact is, all modems are not created equal. For example, some modems are better signal processors than others. And these superior modems can make an important difference in your total network performance. A difference that can lead to important savings in telecommunications costs.

Q. How can a modem make a difference in my telecommunications costs?

A. The primary purpose of a network is to move information to and from end users and thereby improve their productivity. And a superior modem can improve the performance of your network in at least four areas: It can make your network more reliable. Give your end users faster response times. Minimize the time you and your people spend on network management. And a superior modem can also save you money in line charges.

Q. What makes a superior modem?

A. As you know, a modem converts a data stream into a signal that can be sent (usually over a phone line) from Point A to Point B.

Now that may sound simple enough, but there are a number of variables in that seemingly simple scenario. Such as, what's the distance between Points A and B? What's the line between the points? What's the condition and stability of the line? And many, many more. The fact is, each variable carries technical implications that affect the design of the modem. And simply stated, a superior modem enjoys a superior design.

Q. Be specific. How can a superior modem save my company money?

A. Let's face it, modems are not the most expensive part of your telecommunications network. Chances are, line charges are. If you design a modem that can send data more reliably, then that modem can begin to affect your line charges. Every time a modem has a "hit," or an unsuccessful transmission of data, the data must be retransmitted, slowing down response time. The net effect is a reduction in the amount of information carried by the network.

If you use superior modems that give fewer hits, you'll have lower line costs per data unit transmitted and better throughput. Better throughput translates into time and cost savings.

Q. Can a superior modem correct the problem of faulty lines?

A. A superior modem can go a long way toward compensating for poor line conditions—and thus make marked improvements in the hit rate.

Take the IBM 3865 Modem, for example. It contains a custom microprocessor with an advanced algorithm that in effect enlarges the target area of acceptable transmissions. The result is that this reliable 9,600 bps modem can operate very effectively over unconditioned lines. Now imagine all the line conditioning charges you won't have to pay your common carrier.

Q. What other modems does IBM offer?

A. With our new announcements *(see box)*, IBM now offers a full range of modems from 2,400 bps to 14.4 kbps in stand-alone and rack-mounted models. There's also a limited distance modem that goes up to 19.2 kbps.

NEW IBM MODEMS

Q. What about higher speed modems?

A. We recently announced a new 14.4 kbps modem—the IBM 5866, and a new 9,600 bps modem—the IBM 5865. Both are available in stand-alone and rack-mounted models, and function in Communication Network Management (CNM) and non-CNM environments. They have multipoint capabilities, operate over unconditioned lines and now provide expanded line diagnostics.

Q. You mean I can even get phase jitter readings from an IBM modem?

A. Not just phase jitter, but readings for ten analog parameters that measure line quality. You can also do remote modem configurations and tests from the control modem.

Q. What about your limited distance modem (LDM)?

A. The new IBM 5811 is a compact, low-cost, non-CNM, baseband modem that operates over continuous wire or telephone cables. It offers synchronous transmissions at 2,400, 4,800, 9,600 bps and 19.2 kbps.

So if you're looking for reliable modems that are competitively priced, talk to your IBM marketing representative.

If you would like to receive free literature on IBM modems, call 1 800 IBM-2468, Ext. 90. Or use the coupon below. After all, it pays to be informed, because not all modems are created equal.

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DRM, Dept. LS/90
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THE ALTOS 3068, SIX BREAKTHROUGHS IN ONE FOR OEM'S.

CPU BOARD

32-bit MC68020 microprocessor running at 1.5 MIPS with no wait states; 8 Kb high speed cache memory; up to 16 MB virtual address space per program; optional floating point processor.

FILE PROCESSOR SUBSYSTEM

Controls 4 DMA channels for disk, tape, floppy, and parallel printer port; overlapped seeks on up to 3 disks.

RAM BOARD

Can be configured to OEM need up to 16MB using 1MB, 2MB, & 4MB boards.

BREAKTHROUGH PRICE/PERFORMANCE

Combining the 32-bit MC68020, multiple auxiliary processors, and a tuned version of UNIX™ System V, the 30-user 3068 "is capable of a performance that rivals large mini-computers." (Computerworld, April 1985). And it does it for a micro computer price – from $7,000 for OEM quantities.

BREAKTHROUGH MODULARITY

"Using plug-in boards the way a personal computer does really sets Altos apart." (research firm Creative Strategies, Computerworld, April 1985). OEM's can choose from a wide range of modules: 10 to 40 serial ports; 1 to 16 MB of memory; 17 to 200 MB (formatted) hard disk storage.

BREAKTHROUGH HARDWARE DESIGN

"Altos is way ahead of everybody else." (Creative Strategies, Computerworld, April 1985): high speed 8 KB cache maximizes CPU speed, with no wait states; cache is simultaneously shared between many processors; high performance memory management supports demand paged virtual memory; on-board microprocessors handle all I/O processing.

SERIAL COMMUNICATION BOARD

8 MHz 8086 with 10 serial ports: 32 KB RAM on standard board supports Async. and LAN: 128 KB of additional RAM to support X 25, SNA or custom protocols.

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1.2 MB FLOPPY DISK DRIVE

HARD DISK

Expandable to over 200 MB (formatted) using up to three 17, 33, or 68 MB drives, each with its own power supply.

EXPANSION BOARD SLOTS

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BREAKTHROUGH UNIX™ SUPPORT

To meet the most rigorous applications requirements, the 3068 incorporates demand paged virtual memory, record locking, and sophisticated interprocess communication. An optimizing C compiler, symbolic debugger, and a full set of development tools and languages form a complete development environment. Productivity tools include an integrated package of word processing, spreadsheet, DBMS, graphics, and electronic mail.

BREAKTHROUGH COMMUNICATIONS AND NETWORKING

With a variety of protocols and the Altos Worknet™ LAN, 3068 communications span PC's to mainframes. The standard communication board has 10 serial ports, an on-board micro-processor, and up to 128 KB of RAM. The system can be configured with up to four communications boards.

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Continued from page 96

A typical configuration includes an enhanced CPU that is said to offer twice the performance of the basic unit, 2M bytes of main memory, a 32M-byte hard disk, a 1M-byte floppy disk, an Ethernet controller, six RS-232 I/O ports and one Versatec, Inc. I/O port. The typical configuration costs $41,700.

Computervision, 15 Crosby Drive, Bedford, Mass. 01730.

DATA STORAGE

■ **Wilson Laboratories, Inc. has unwrapped a disk drive analyzer that is said to test up to four Winchester-type drives in sequence.**

The Digital Analog Test System-2000 (Dats-2000) analyzer incorporates analog testing for missing pulse, extra pulse, phase margin, amplitude and resolution. Digital analyses verify media defects, measure read window margins and check format, write/read, timing, seek action and status/control monitors.

Analyzers that work with all Storage Technology Corp. ST506 or ST412 drives cost $14,950. The Dats-2000 may be ordered for drives with an enhanced small disk interface at a cost of $15,175.

Wilson Laboratories, 2237 N. Batavia St., Orange, Calif. 92665.

TERMINALS

■ **Wyse Technology, Inc. has announced the release of two Ascii terminals that will be sold through distributors and OEMs.**

The WY-50+ is an enhanced version of Wyse's WY-50 and is aimed at the full-function terminal market. It features two to four times the display memory of the WY-50 and terminal emulations for the IBM 3101, the Data General Corp. 200 and Televideo Systems, Inc.'s 950 terminals. It also features a bidirectional auxiliary port, enhanced function key capabilities and an amber display. The unit costs $699, and it has an optional four-page memory that costs $30.

The WY-30 is a low-end unit for basic applications such as data entry. The unit features a mechanical switch keyboard, four dedicated function keys, 41 programmable functions, an 80-col. display, a printer port, split-screen capability and a 14-in. flat screen.

The unit is compatible with Lear Siegler Corp.'s ADM 3A/5, Applied Digital Data Systems, Inc.'s Viewpoint terminal and Televideo Systems, Inc.'s 925 and 910+ terminals. It can send data at 38.4K bit/sec. The WY-30 costs $399, and it has an optional tilt-and-swivel base and a height-adjustable arm that cost $20 and $99, respectively.

Wyse Technology, 3571 N. First St., San Jose, Calif. 95134.

■ **Intecolor Corp. has introduced a color graphics terminal for Digital Equipment Corp. and other serial ported minicomputers.**

The 8820 terminal features one page of dot-addressable screen memory, an 80-char. by 48-line screen format and 480- by 384-pixel resolution on a 19-in. color display. Users may

Continued on page 113

From page 100

CIM: Future of factory management

against a plan can be made as soon as a production process is completed. The plan, however, has to be an extremely accurate projection.

CIM will improve financial projections by improving financial control.

Information model

The information model of CIM is quite simple. It is composed of four parts: input, processing, output and feedback. This model is applicable both to CIM as a whole and to each distinct business application because both the whole and the parts are closed-loop systems.

Business planning serves as the overall closed loop. It monitors output from one production application and immediately inputs modifications to related applications.

Every application functions as a discrete loop. Each element of CIM, then, is a control loop within the control loop of business planning.

From page 104

DFM aids priorities in design cycle

the manufacturing process or degree of automation employed. DFM methodologies will help even the smallest manufacturer who relies solely on manual assembly.

Users of DFM techniques report the following benefits:

- Direct labor and material cost reductions.
- Product consistency and quality improvement with subsequent reductions in scrap, warranty and product liability costs and improved market share.
- Production and inventory control cost reductions.
- Improved interaction between design and manufacturing.
- Employee attitude and morale improvement.

DFM works because it provides an effective tool for product analysis and evaluation, which in turn ensures that manufacturing considerations enter early into the product design cycle.

DFM is the basis for a common language between research, design and manufacturing technologies. This language will promote the cooperation and understanding needed to achieve improved manufacturing productivity.

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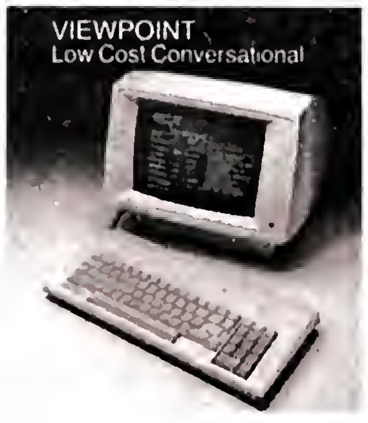

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Continued from page 108

choose any one of eight foreground colors on any one of eight background colors, the vendor said.

The unit costs $3,495.

Intecolor, Intecolor Drive, 225 Technology Park, Norcross, Ga. 30092.

PRINTERS/PLOTTERS

■ Florida Data Corp. has announced that it has added an internal interface capability to its matrix printer Models OSP 130 and 3000 to allow compatibility with IBM's System/34, 36 and 38 minicomputers.

The Model OSP 130 is said to have a triple paper path.

It comes with seven resident fonts and prints up to 600 char./sec. in draft mode and up to 100 char./sec. in letter-quality mode, according to Florida Data.

The Model 3000 tractor-feed data processing printer comes with six resident fonts and prints up to 675 char./sec., the vendor said.

The Model OSP 130 costs $5,995, and the Model 3000 costs $5,395, the vendor said.

Florida Data, 600D John Rodes Blvd., Melbourne, Fla. 32935.

GRAPHICS SYSTEMS

■ Lexidata Corp. has released a direct memory access interface for its LEX 90 family of graphics display systems and Digital Equipment Corp.'s Microvax II product line.

The 22-bit Q-bus interface uses burst mode operation that is said to transfer data at up to 4 bytes per memory acquisition for enhanced graphics response time.

A built-in diagnostics feature reportedly enables testing and servicing of the interface by OEMs.

The interface costs $1,595, according to the vendor.

An optional software driver and graphics library for DEC's MicroVMS operating system is said to facilitate system integration by allowing access to Lexidata's graphics commands.

The driver and library cost $2,000, Lexidata said.

Lexidata, 755 Middlesex Tnpk., Billerica, Mass. 01865.

■ Raster Technologies, Inc. has announced that it has reached an agreement with Texas Instruments, Inc. of Austin, Texas, in which customers for TI's Lisp-based Explorer symbolic processor system can receive Raster Technologies' color graphics systems.

TI is said to have developed software to integrate Raster's color graphics controllers with the Explorer.

Raster has developed an interface adapter card for use with the TI Explorer.

TI will reportedly be sublicensing Raster software and acting as a marketing representative for the Raster card.

The graphics systems supplied by Raster will range from the low-end Model One/10 up to the recently introduced Model One/380, according to Raster.

Prices will range from $6,925 to $41,000 — in quantities of one — depending upon features selected, a spokesman said

Raster Technologies, 9 Executive Park Drive, North Billerica, Mass. 01862.

From page 95

School district's drives get high marks

nance costs for the IBM and NAS equipment are about the same, he added.

Before NAS added the cache controller feature to its disk devices, Brewer bought two strings of IBM 3380s that had the controllers. Buying devices with the cache feature was an attempt to upgrade the response time performance of the computer center's CICS applications, Brewer said.

The NAS disk drives have worked as well as, and maybe better than, the two IBM 3380 strings. "We have been getting hit rates in the 90% to 98% range in the cache with the Hitachi [NAS] controllers, and we've been getting good hit rates with the IBM also . . . about 85-87% . . . but it's a different application, and I can't say that NAS is better," Brewer said.

The district has Software AG's Adabase data base to keep track of its student information. The index for that information is kept in the cache, so when a user needs data, the system does not have to seek from the disk drive controller itself.

The difference in the size of the two IBM storage device strings and the two NAS strings is slight, Brewer said.

From page 95

SI clusters Microvax II with interface to 9000

msec seek time. The unit is available in four storage configurations ranging from 120M-byte ($10,000) to 1.9G-byte ($50,000) capacity.

The company's Disk Cache Processor (DCP) reportedly reduces average access time to less than 2 msecs. The DCP allows most frequently used data from the disk to reside in the cache memory so that the CPU need not access the disk for each request. The DCP has a 2M-byte capacity and is controlled by a Motorola, Inc. 68000 microprocessor. It costs $20,000 with a six-readout LED display performance monitor system; the system costs $15,000 without the monitor.

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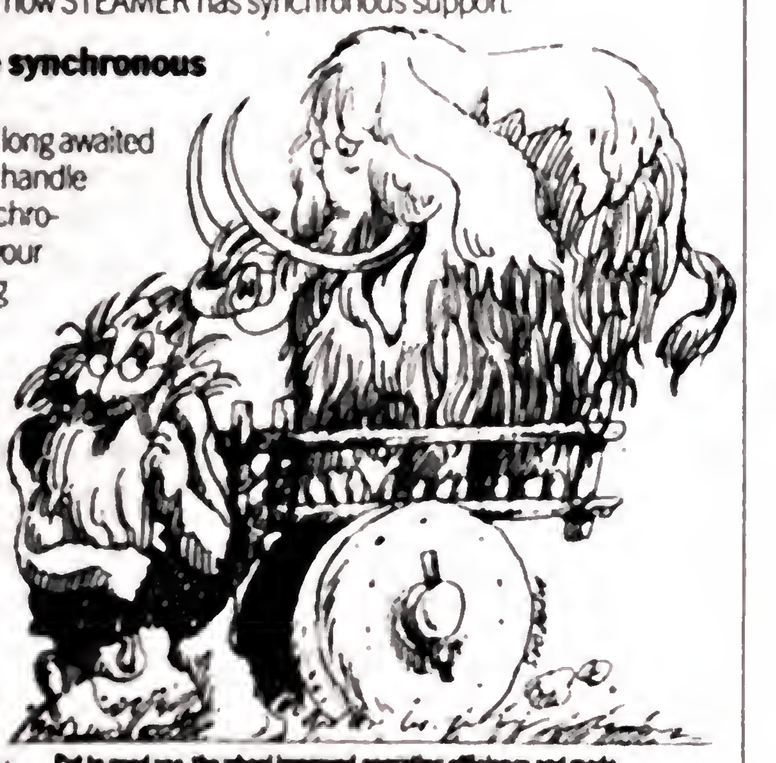

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   - **80.** Manufacturer of Computers, Computer-Related Systems or Peripherals
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COMPUTER INDUSTRY

Analyst: Chip market down until 1988

By Clinton Wilder

BOSTON — The worldwide market for semiconductors will not return to its record 1984 levels until 1988, according to Jack Beedie, president of In-Stat, Inc., a Scottsdale, Ariz., semiconductor market research firm.

Beedie, speaking at a recent briefing of the Semiconductor Equipment and Materials Institute, Inc. here, predicted that a coming U.S. recession and the lack of a future chip-based product boom combine to spell continued rough times for U.S. integrated circuit vendors.

"In the computer and computer peripheral industry, a lot of the people who bought vast quantities of chips aren't around anymore," Beedle said. "And there is no new 'hula hoop' — no new super growth market that would support a continuation of runaway semiconductor usage."

Beedle cited handheld calculators, citizens band radios, digital watches, videocassette recorders, video games and microcomputers as products that have driven the semiconductor boom cycles since the early 1970s.

More ominous for the near term are the vast inventories accumulated by major computer manufacturers during the current industry slump. From March 1984 to March 1985, according to In-Stat, Apple Computer, Inc.'s inventory increased by 113%, Data General Corp.'s by 38%, Sperry Corp.'s by 33% and Digital Equipment Corp.'s by 16%. Reducing those stockpiles in a low demand period is a slow process that translates into continued slow sales of chips to computer vendors.

"Computer manufacturers increased their semiconductor purchases by 63.5% in 1984 while the industry grew only 18%," Beedle noted. "That means a lot of unsold equipment." In-Stat has predicted a 53% drop in computer vendors' chip purchases this year and a modest 2.2% decline in 1986 before an upturn the following year.

In other semiconductor market industries, such as industrial and consumer applications, a U.S. slide into recession in the near future will keep a damper on demand, Beedle said.

"The probability of recession looms over everything," he said. "The business expansion cycle, which historically lasts 36 months, has run out of gas. . . . The continuation of economic decay, spilling over into all segments of the manufacturing sector, paints a bleak picture for the semiconductor industry in the near term."

The battle for the shrinking chip market has sparked charges and countercharges between U.S. and Japanese vendors over pricing and trade barriers [CW, Sept. 2], but Beedle claimed the Japanese import issue is a very small part of U.S. chip makers' current woes.

"I really don't think these suits will amount to much," he said. "If they're talking about drastic price cutting, everyone does it."

- The ax from IBM's contract termination fell on 160 employees at Computer Memories/**116**
- Eleven hardware vendors have formed a trade group to seek and promote non-Unix data base standards/**120**
- AT&T and the Spanish telephone company received the go-ahead to make Cmos chips in Spain/**122**

GEM buoys Digital Research

Firm looks to corporate sales to boost revenue

By Eric Bender

FRAMINGHAM, Mass. — Shifting its emphasis from microcomputer systems software to applications packages in the past year, Digital Research, Inc. experienced a sharp downturn in sales and slashed its work force by more than half, from more than 600 people to less than 300.

But the Monterey, Calif., firm has seen strong demand for its Graphics Environment Manager (GEM) applications, with 30,000 units shipped in the first 90 days of deliveries, company President John Rowley said in an interview recently.

Additionally, a $10 million cash infusion from Motorola, Inc. and Northern Telecom, Inc. announced in July leaves Digital Research well funded for its thrust into the applications market, Rowley emphasized in an interview here recently.

"A year ago at this time, 80% of our sales was system software for OEMs, and 20% was retail," with retail business split between graphics applications and system and language products, Rowley said. Digital Research's current new business in the U.S. is about 60% retail, almost exclusively GEM applications, and 40% OEM.

He declined to give specific financial figures, stating only that Digital Research showed the highest sales figures for its fiscal year ended Aug. 31 in the fourth quarter and that he expects the current quarter

Continued on page 131

Downturn seen in service bids

By Peter Bartolik

The bid offers for third-party service companies may have already exceeded the value of such acquisitions, according to a planning executive with one of the first large systems vendors to move toward integrated systems services.

William E. Charlton, vice-president of marketing and business management operations with Honeywell, Inc.'s Customer Services Division, said in a recent interview that sales prices for third-party service organizations will probably recede to more realistic levels.

Honeywell's Customer Services Division has been involved in third-party service

Continued on page 130

Lotus position inconsistent

INDUSTRY INSIGHT
Peter Bartolik
and Clinton Wilder
CW Staff

What's good for the goose isn't good for the gander.

Lotus Development Corp. insistently holds to its policy of not granting site licenses to large users of its 1-2-3 and Symphony products. But if you want to sell something to Lotus, a different rule applies.

In an interview with the *The Boston Globe* recently, former Software Arts, Inc. Chairman and Visicalc co-developer Daniel S. Bricklin said he is developing a program for software developers, and Lotus, which bought Software Arts' assets and employed Bricklin until Sept. 1, will be a tester and first user. Bricklin said Lotus will receive a site license to use the product and a copy of source code for internal use.

■

The public relations fickle finger of fate award this week goes to Digital Equipment Corp. Attempting to track down a spokesman recently, a reporter was informed that the DEC man was at a press conference. Asked what the press conference concerned, the DEC employee informed the member of the press that, "I don't think I'm at liberty to tell you."

Good thing salesmen don't use that approach with customers.

■

At a recent press briefing in Boston, Varian Associates' Executive Vice-President Larry Hansen called for an end to trade barriers, but it was a plea with a different twist. Hansen said the biggest roadblock

Continued on page 131

PE looks to new products as buffer against slump

NORWALK, Conn. — Bucking a depressing trend for minicomputer and semiconductor vendors, Perkin-Elmer Corp. recently reported operating profits were up 38% for the year ended July 31 and up 20% for the fourth quarter, although net profits declined in the last quarter compared with last year's results.

Horace G. McDonnell, chairman and chief executive officer of the company, said in a statement announcing the results that economic conditions have weakened in recent quarters, but the company "hopes to counter these trends with new products and more focused marketing." He added that it seems clear a more difficult period is ahead.

The company posted operating profits for the year of $134.2 million, compared with $97.4 million the previous year. Operating profits in the fourth quarter were $40.3 million, up from $33.5 million a year earlier.

Net profits, including extraordinary items both years, were $82.1 million, or $1.84 per share, for the year just ended, compared with $66.1 million, or $1.49 per share, in the previous year. Excluding the extraordinary items, 1985 profits would be $1.77 per share, compared with $1.30 per share in 1984.

In the fourth quarter, net profits were $24.3 million, or 54 cents per share, down from year-earlier net profits of $29.1 million, or 66 cents per share. Excluding extraordinary items, fourth-quarter profits would be 56 cents per share, compared with 47 cents per share a year earlier.

Revenue in the fourth quarter was up approximately 3% to $350.2 million, compared with $340 million in the last quarter of 1984. For the year, revenue was up 10% to $1.3 billion, compared with $1.18 billion in 1984.

CMI lays off 160 employees in wake of lost IBM contract

CHATSWORTH, Calif. — Computer Memories, Inc. (CMI), which recently announced that IBM had declined to renew a contract for CMI's microcomputer disk drives, laid off 160 of the 440 employees at its headquarters here.

The contract to supply 20M-byte hard disk drives to IBM expires at the end of this year and accounted for 67% of CMI's sales in the fiscal year ended March 31 and 81% of sales in the quarter ended in June [CW, Aug. 19].

The dismissals took effect Aug. 30, CMI said.

Irwin Rubin, chairman and chief executive officer, said in a prepared statement that the company is seeking to reduce costs in virtually every aspect of its business.

He said the company will continue to concentrate its resources on engineering, product development, sales and marketing.

The company will continue to transfer production functions to its Singapore facility.

According to Rubin, the Singapore facility will soon be able to fill all of CMI's production requirements, including new orders.

Filing software copyrights

SECOND IN A SERIES

By Jerome Roberts
and Michael Brownell
Special to CW‡

Previously, we discussed steps owners of proprietary software should take to establish copyright. There are also various issues concerning the registration of software with the U.S. Copyright Office as well as an owner's legal remedies to prevent, restrain or recover damages from a copyright infringement.

REGISTRATION

Registration of software at the Copyright Office is not a precondition to owning a copyright. However, several considerations support early registration. An owner must register a copyrighted work prior to commencing an infringement suit relating to that work; moreover, timely registration creates a presumption of copyright validity as well as preserving the availability of several statutory remedies.

Registration involves completing and submitting to the Copyright Office one of several registration forms that it provides, along with a $10 registration fee and a copy of the copyrighted materials. While the registration process was designed to be simple, sometimes software-specific issues, particularly trade secret considerations, can make compliance difficult. Accordingly, the owner may wish to consult an attorney experienced in the software area prior to registering software.

Arguably, filing a source code with the Copyright Office endangers or even forfeits trade secret protection because the source code becomes a public document. However, the Copyright Office has attempted to foreclose the issue altogether by establishing an "alternative deposit" procedure for software containing trade secrets.

To use the alternative deposit option, the owner must advise the Copyright Office in writing that depositing the first and last 25 pages of source code would disclose trade secret material and submit one of the following alternative deposits: the first and last 25 pages of source code with the trade secret code blocked out, the first and last 10 pages of source code in its entirety or the first and last 10 pages of object code and 10 consecutive pages of source code.

Owners sometimes deposit only object code. Although such a practice serves to lessen the likelihood of trade secret disclosure, it will prevent the Copyright Office from issuing an unqualified certificate of registration.

COPYRIGHT REMEDIES

The unauthorized exercise of any of the owner's exclusive rights constitutes copyright infringement, conferring upon the owner remedies available from federal courts:

- The owner may obtain a court injunction to prevent or restrain the infringing activity and a court order to impound and ultimately destroy the infringing articles.
- The owner may also seek monetary damages equal to its loss and/or the infringer's profits from the infringing activity.
- The owner may request statutory damages in an amount not greater than $50,000, provided the owner has registered the software under the Copyright Act in time to be eligible for statutory damages and provided it is impossible for the owner to prove actual damages.

Roberts and Brownell are attorneys with the law firm of Berman, Roberts & Kelly in Chicago. This firm's practice deals with legal issues relating to procurement, development, distribution, management and protection of computer resources.

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Mergers, acquisitions growing in info services mart

OUTSIDE LINES
Edward I. Metz

The information services and software industry is one of the most acquisitive in the U.S. economic structure.

According to the Broadview Associates/Association of Data Processing Service Organizations, Inc. Index, an annual recap of merger and acquisition activity in the information services and software industry marketplace, this relatively small ($39 billion in 1984) segment turned in nearly 150 acquisitions for the year, bringing the total for the first half of the decade to 650 completed deals with a total value of more than $6.5 billion. In fact, the information services and software industry acquisition activity is exceeded only by that of the banking and finance communities.

From the buyer's perspective, acquisition continues to satisfy traditional objectives. It provides a relatively low-risk method for adding products, services, markets and technology; a ready-made pool of talented personnel; an opportunity for rapid geographic expansion; and a method of supplementing internal growth to meet ambitious financial objectives.

While return on investment criteria have traditionally been considered, return on investment per se has not been the dominant consideration in the short run. This factor could change in the future as buyers' ranks swell with firms from outside the industry accustomed to slower growth rates and different market conditions that demand more conservative investment considerations.

There's money to be made

From the seller's point of view, enormous personal wealth is being created through these transactions, as more and more entrepreneurial owner/operators achieve financial independence. The acquisition of Electronic Data Systems Corp. (EDS) by General Motors Corp. in 1984 produced more personal wealth for EDS' largest stockholder than the total of the top 50 entrepreneurs who took their companies public during that year.

The high rate of merger and acquisition activities is having a profound effect on the overall structure of the industry. In the past five years, the number of firms with annual revenues in excess of $100 million has more than tripled from 20 companies in 1979 to nearly 70 in 1984. These include some of the most acquisition-oriented firms in the industry, such as Automatic Data Processing, Inc., EDS, McDonnell Douglas Automation Co. and Computer Sciences Corp.

In the past five years, a number of new forces has been at work driving the merger and acquisition apparatus in this industry even harder.

The initial public offering window is closed for all but extraordinary cases, making mergers and acquisitions the only viable alternative for many firms in need of capital infusion.

At the same time, the venture capital community's focus on shoring up their portfolios by pruning the less promising properties will continue to serve as an effective blockade to firms seeking venture capital funding.

With these two avenues blocked at a time when second- or third-round financing is required, dozens and perhaps hundreds of firms will be driven to the merger and acquisition alternative to keep momentum going, if not to stay afloat.

During the past 10 years we have seen aerospace and energy firms enter the market through acquisitions. More recently, publishers, insurance companies, banks and hospital services have joined in, and even more banks are expected to join the fray. Communications firms and hardware manufacturers will almost certainly see more action.

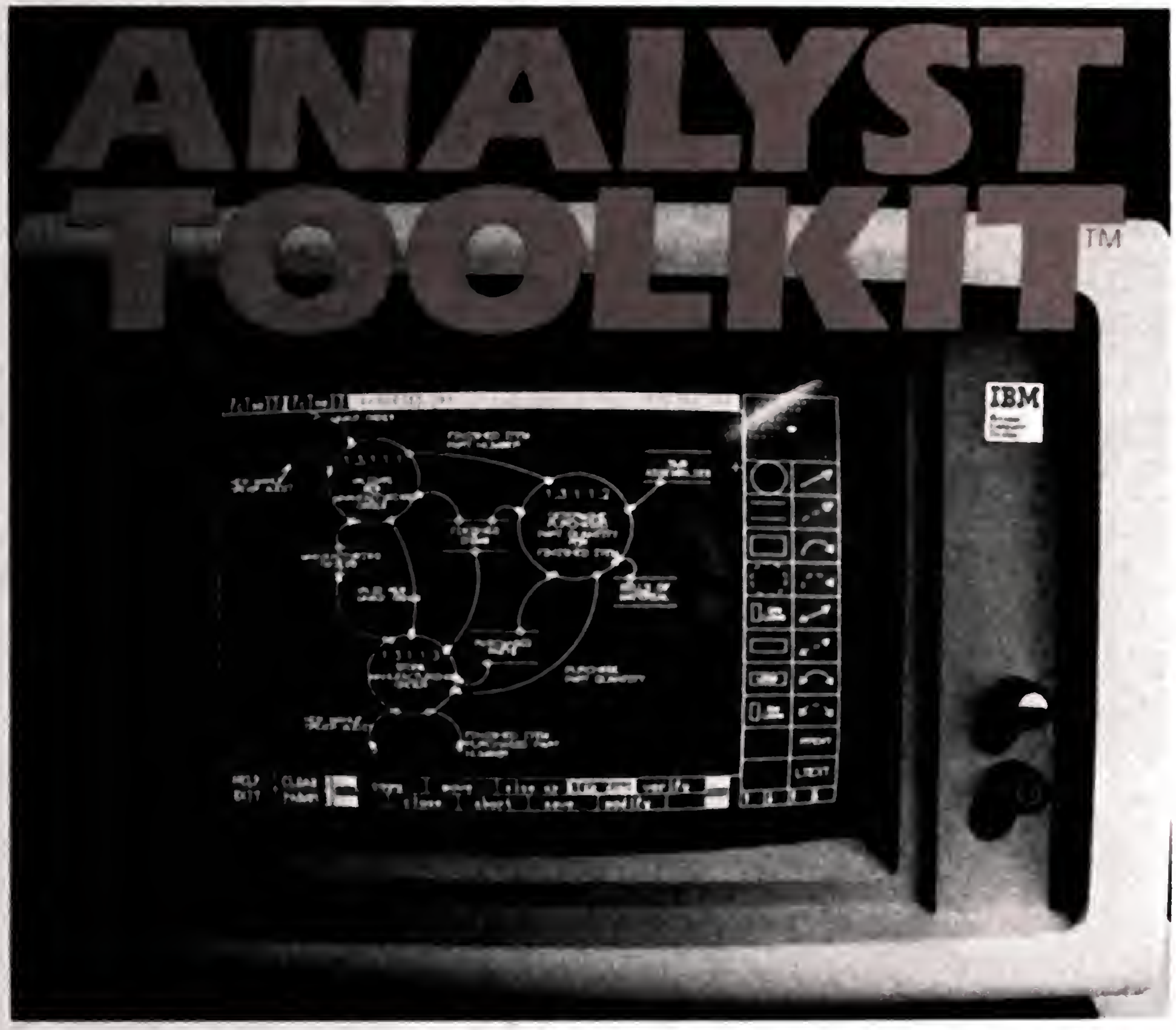
The net result is more acquisitions of smaller services and software firms. These firms offer the acquirer the venue to build complex systems, attract competent information professionals and penetrate specialized vertical market niches. Smaller information services and software industry firms often provide earnings and growth rates far exceeding those in traditional, more mature industries.

Larger firms in this industry are also poised for a higher level of merger and acquisition activity. Others are recognizing the need to shift from functional or cross-industry marketing strategies to vertical industry approaches.

The purging of the micro industry, which began in 1984, will continue for the next several years as the result of far too many products in already saturated distribution channels. Although there will be failures, there will also be some highly creative solutions applied to the bailout and rescue problem. The information

Continued on page 131

Metz is a partner with Broadview Associates, a Fort Lee, N.J.-based firm that specializes in information industry mergers and acquisitions.



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Trade group to develop data base standards

LAS VEGAS — Executives from 11 hardware vendors recently announced here the formation of a trade association to create technical standards for and promote a number of related data base environments.

The group, in announcing its formation, left little doubt that part of its intent is to promote data base environments as a better alternative to AT&T's Unix and variants.

"The operating systems we use are closely related to each other," said Leonard M. MacKenzie, chairman of General Automation, Inc. and acting chairman of the new association. "There is at least as much transportability between these sophisticated relational data base managers as there is in the so-called Unix world."

Hosting the meeting of the vendors and named as the association management company for the group was the International Data Base Management Association, a trade group devoted to promotion of Pick Systems, Inc. Pick operating system-based machines and variants.

Firms represented at the meeting were CDI Information Systems, Inc.; CIE Systems, Inc.; Cosmos, Inc.; Datamedia Corp.; Fujitsu Ltd.; General Automation, Inc.; McDonnell Douglas Computer Systems; Nixdorf Computer Corp.; Prime Computer, Inc.; Systems Management, Inc.; and Ultimate Corp.

Tandon cuts work force by 131

CHATSWORTH, Calif. — Disk drive manufacturer Tandon Corp. recently announced the layoff of 131 employees, most of them from manufacturing positions.

The company said the cutbacks resulted from a decision to combine its floppy disk drive manufacturing and engineering operations, previously located at company headquarters here, with its Winchester disk drive operations in Simi Valley, Calif.

The company said the action reduces its domestic work force to about 1,000 people. The company, which has suffered financial setbacks in recent quarters due to a transition to new products, has located much of its production offshore.

Shareholders OK Harvard Software sale

MOUNTAIN VIEW, Calif. — The shareholders of Harvard Software, Inc. approved the company's acquisition by Software Publishing Corp. late last month, marking the final step in the $4.2 million purchase.

The shareholders agreed to terms under which they will receive 400,000 shares of Software Publishing, the developer based here of the PFS series of business microcomputer software.

Software Publishing has closed Harvard Software's former headquarters in Littleton, Mass., and has moved the operation to California. Software Publishing will market and sell Harvard's Project Manager and Total Project Manager software from the West Coast office.

Software Publishing retained only eight of Harvard's 30 employees. Those who were not retained were offered severance packages.

In another development, Software Publishing recently sold its Power Up! division to a new spin-off firm, of which it owns 10%. The firm, Channelmark Corp., will sell accessory software "the way L.L. Bean sells outdoor gear," according to President Edward Lauing, former head of Software Publishing's catalog division.

Channelmark will move next week from Software Publishing's headquarters to a new office in San Mateo, Calif.

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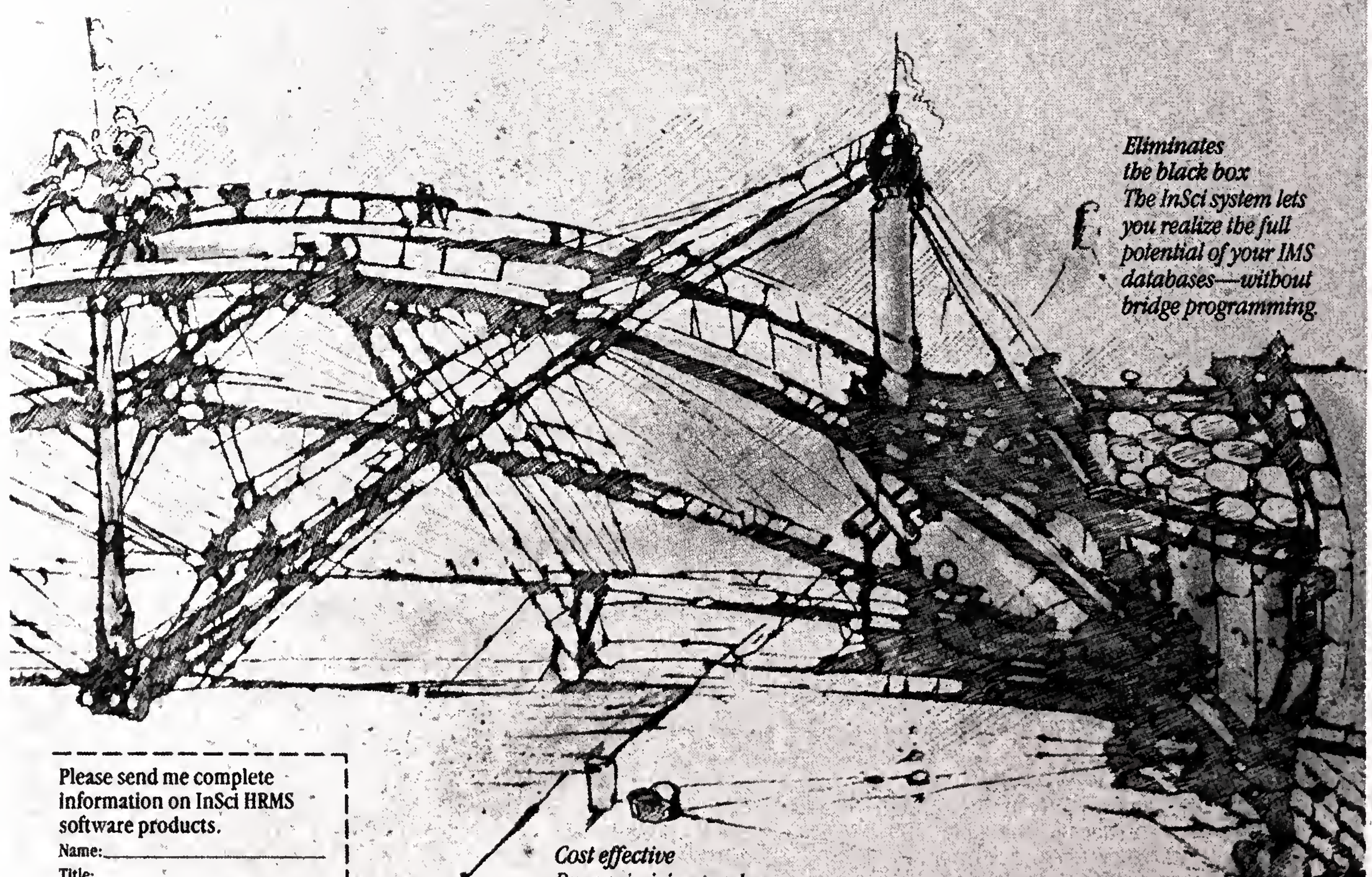

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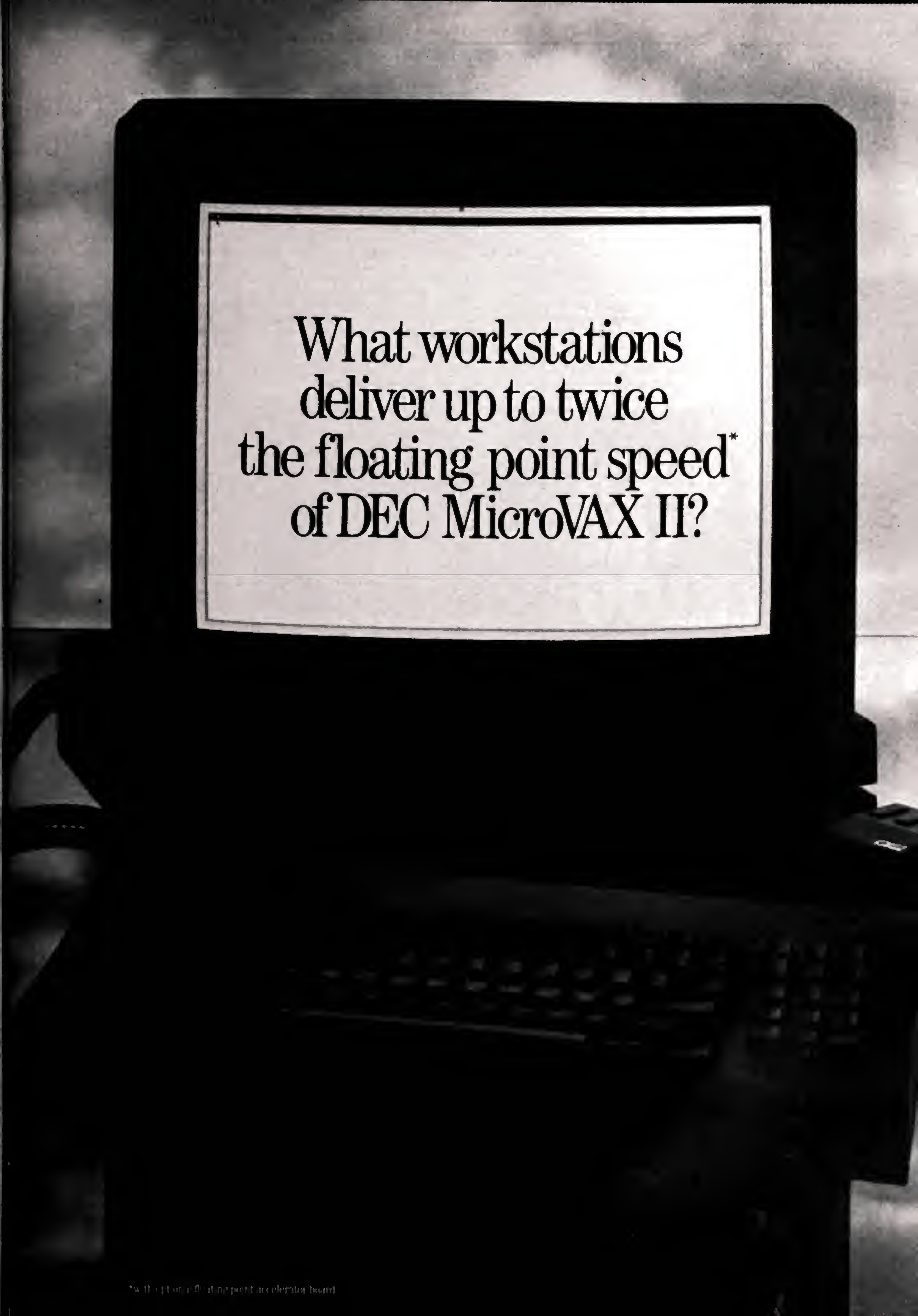

What workstations deliver up to twice the floating point speed* of DEC MicroVAX II?

*with optional floating point accelerator board

Hitachi to purchase U.S.-made products

Datacom, Microsoft gain major contracts

NEW YORK — Datacom Industries, Inc. of Middlebury, Conn., and Microsoft Corp. of Bellevue, Wash., were among the contract winners as Hitachi Ltd. recently announced agreements to purchase $25 million worth of U.S.-made computer and electronics products.

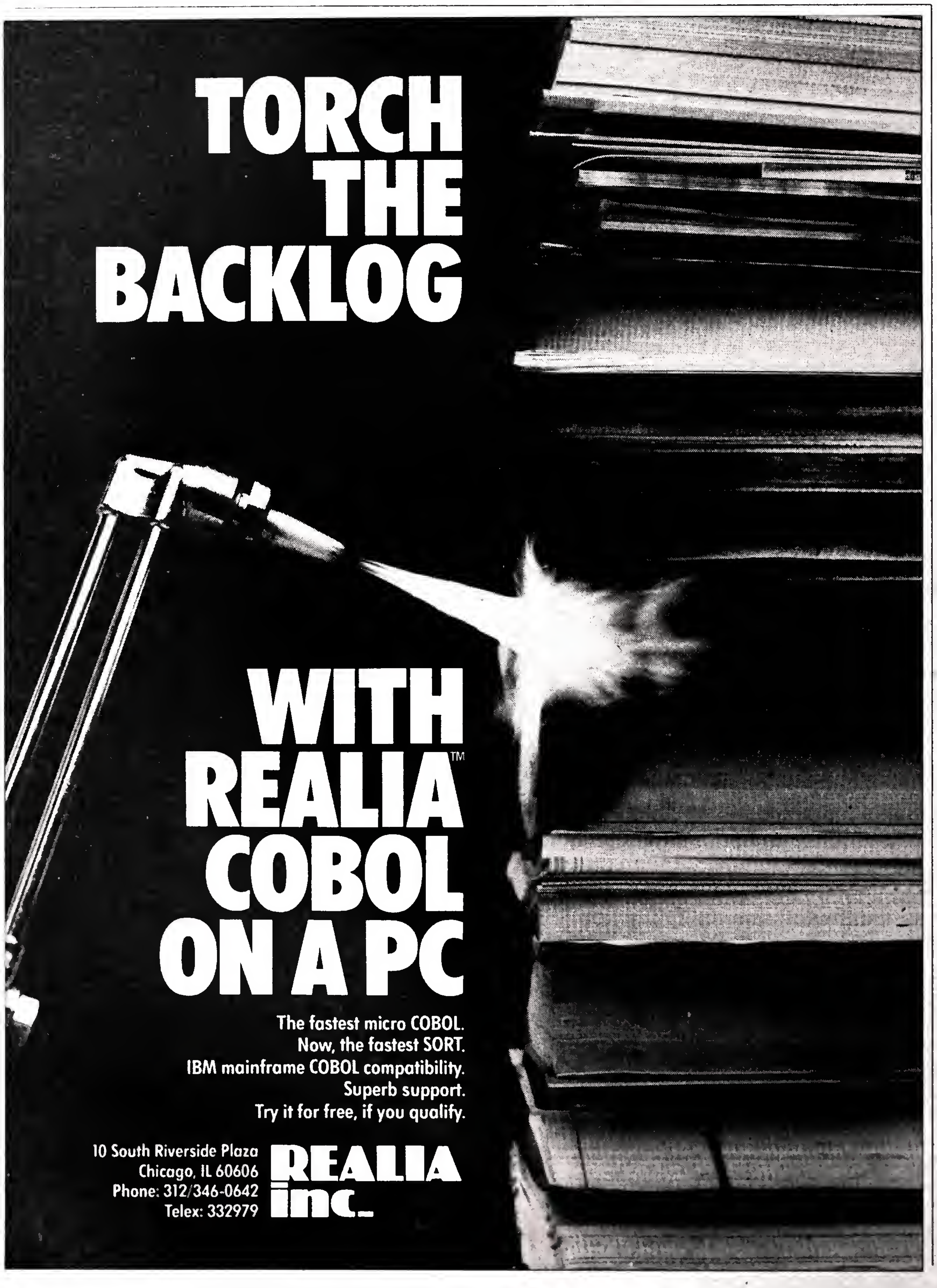
The Japanese industrial giant said it will announce additional contracts with U.S. vendors totaling $15 million in the next two months, part of its plan to buy $400 million worth of U.S. products in fiscal 1986.

Datacom Industries, with a contract worth $4 million, and Technology for Communications International, Inc. of Mountain View, Calif., with a $3 million contract, shared Hitachi's $7 million purchase in the telecommunications field.

Microsoft's $2.3 million contract represented the lion's share of Hitachi's $4.3 million investment in industrial components and other products, which include software.

The largest product category involved in the purchases was manufacturing, research and development equipment, in which Hitachi signed contracts worth $12 million and reached agreement on $15 million in additional contracts to be announced. Major U.S. vendors included were Digital Equipment Corp. with a $1 million contract, Hewlett-Packard Co. with a contract worth $1.3 million, Genrad, Inc. with a $1.3 million contract and Tektronix, Inc., which won a $700,000 contract.

Notably absent from the purchase list were U.S. semiconductor manufacturers, some of which have accused Hitachi of predatory pricing and other unfair trade practices in their campaign for greater access to Japanese markets. Hitachi Executive Vice-President Shiro Kawada said the company will be sending an "import promotion team" to the U.S. by the end of the year specifically to purchase U.S.-made chips.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AT&T Spain venture gets U.S. license

BERKELEY HEIGHTS, N.J. — AT&T announced recently it has received a U.S. Department of Commerce project license required to begin construction of a proposed semiconductor plant in Spain.

AT&T said the license marks formal approval to move forward with plans for a joint venture with Telefonica, Spain's national telephone company.

The venture, called AT&T Microelectronics Espana, will be located outside of Madrid, and the plant is scheduled for completion in 1987, a spokesman said.

The plant will manufacture Cmos integrated circuits. AT&T said the venture will employ approximately 700 people and will not have any adverse impact on AT&T's domestic work force.

NAS announces Korean venture

MOUNTAIN VIEW, Calif. — National Advanced Systems Corp. (NAS), the mainframe manufacturing subsidiary of National Semiconductor Corp., recently announced the formation of a joint venture company with Hyosung Corp. of Seoul, South Korea, to distribute NAS data processing equipment in the Republic of Korea.

Hyosung is a $2 billion diversified manufacturing company with more than 20 subsidiaries producing a broad range of products, including some DP equipment.

The joint venture began operations Aug. 29. At the same time, Hyosung-NAS announced its first sales, an AS/8083 system purchased by the South Korean government for the Korea Advanced Institute of Science and Technology and an AS/6630 purchased by Tongyang Nylon Co.

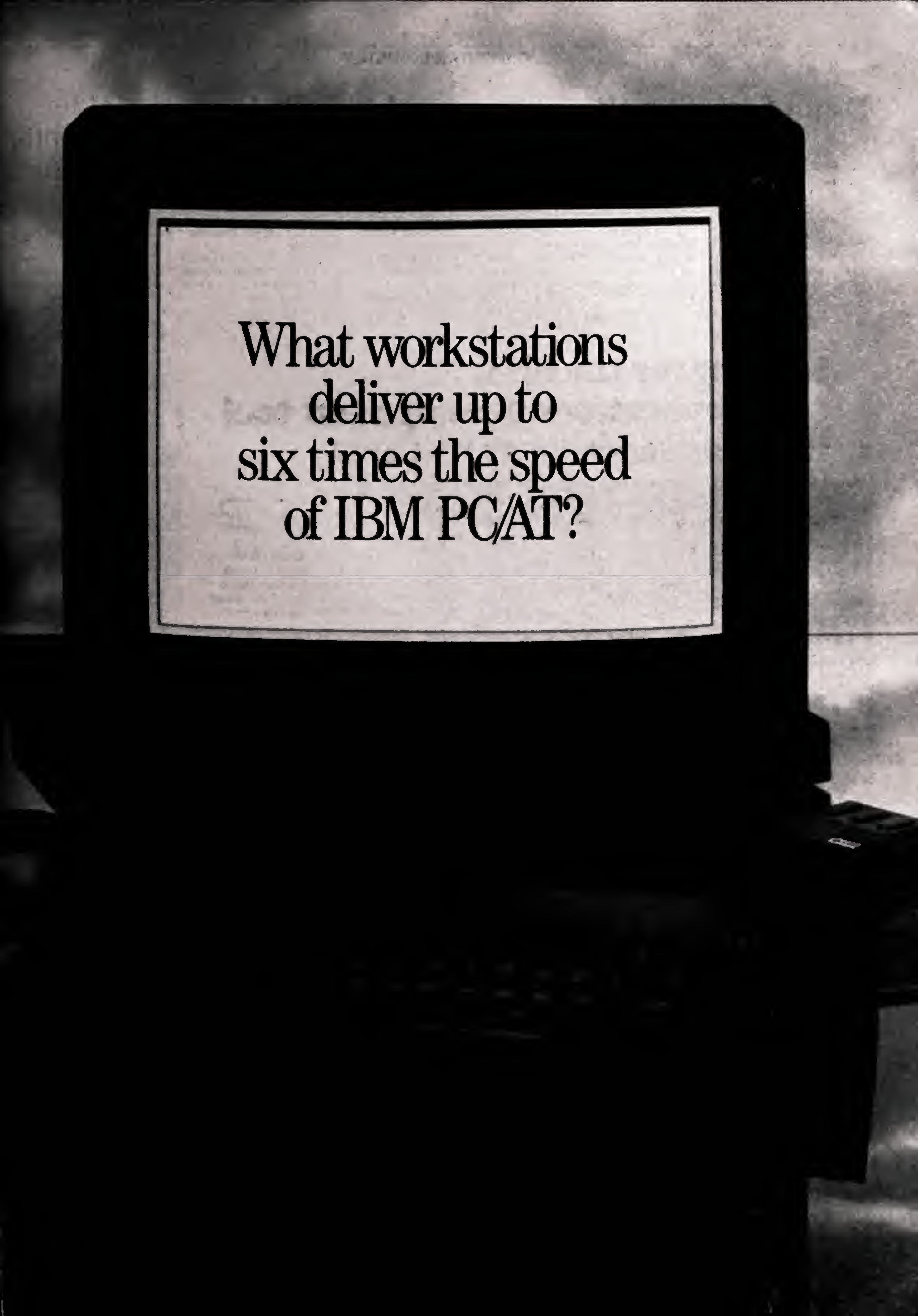
Xebec settles with Miniscribe

SAN JOSE, Calif. — Xebec Corp. and Miniscribe Corp. recently announced an out-of-court settlement of a disputed $2.2 million contract on which litigation had been pending since April.

Miniscribe, of Longmont, Colo., had sought to collect the amount from Xebec, which had contracted to purchase Miniscribe's 5¼-in., 10M-byte disk drives.

In a counterclaim, Xebec, based here, had charged that Miniscribe broke the contract by changing the specifications and performance of the drives.

In the settlement, Miniscribe agreed to offer Xebec price discounts and most-favored-customer status.


What workstations deliver up to six times the speed of IBM PC/AT?

Dyna found guilty of copyright violations

SANTA CLARA, Calif. — computer retail store has been ordered to forfeit its entire inventory of alleged Taiwanese copies of Hercules Computer Technology, Inc. graphics cards.

In an Aug. 5 ruling in U.S. District Court in San Jose, Calif., Judge William A. Ingram ruled that retailer Dyna Systems violated trade, copyright and unfair competition laws by selling copies of the Hercules Graphics Card, a monochrome graphics expansion board for the IBM Personal Computer.

Dyna Systems, a single-store operation, was ordered to pay Hercules' legal expenses for the July 5 suit and turn over the boards, software diskettes and operating documentation to Hercules for either destruction or disposal.

'Unfair competition'

"It was unfair competition and was causing confusion in the marketplace," said Michael W. Hall, attorney for Berkeley, Calif.-based Hercules.

"The strategy of Hercules is to go after stores that are selling rip-off copies of our products. We will be watching the marketplace and will monitor complaints from our customers to ensure they are not using copied products," Hall added.

Hall said he did not know the number of boards that Dyna Systems will turn over to Hercules.

Franklin pays debts, issues stock

PENNSAUKEN, N.J. — Franklin Computer Corp. recently issued more than 70,000 shares of its common stock to creditors in the latest phase of its bankruptcy reorganization plan.

The vendor of Apple Computer, Inc.-compatible microcomputers issued the shares to 500 creditors to settle approximately $7 million in debts by issuing one share per $100 of debt. Under its reorganization plan approved by the federal Bankruptcy Court in Philadelphia last February, Franklin may issue up to 250,000 shares to settle its accounts.

The creditor-shareholders will share ownership of the company with management and the New York venture capital firm of Renaissance Technologies. Renaissance partner Morton E. David is Franklin's chairman, chief executive officer and president.

In order to reemerge in the personal computer market, Franklin plans to shift much of its production to the Far East.

Last month, Franklin acquired Cord Electronics, Inc. of Westbury, N.Y., an OEM vendor of electronic components and subassemblies from its plants in Japan, Taiwan, Hong Kong and South Korea. "It is anticipated that a substantial portion of Franklin's future product lines will be manufactured in Asia," according to a spokesman.

Franklin is expected to announce a microcomputer product line, the Ace 2000 series, later this month.

NICKELS AND DIMES

Xidex Corp. reported revenue for the fiscal year of $259.5 million, an increase of 46% over the $178.2 million for the previous year. Profits for the year were $24.5 million, or 81 cents per share, compared with $24 million, or $1.06 per share, in the like period one year earlier.

Revenue for the quarter ended June 30 was $88.4 million, up 73% from $51.2 million for the same three months a year ago. Profits were $7.9 million, or 19 cents per share, compared with $6.4 million, or 28 cents per share, in the comparable period one year earlier.

■

Trilogy Ltd. reported rev-

See DIMES page 126

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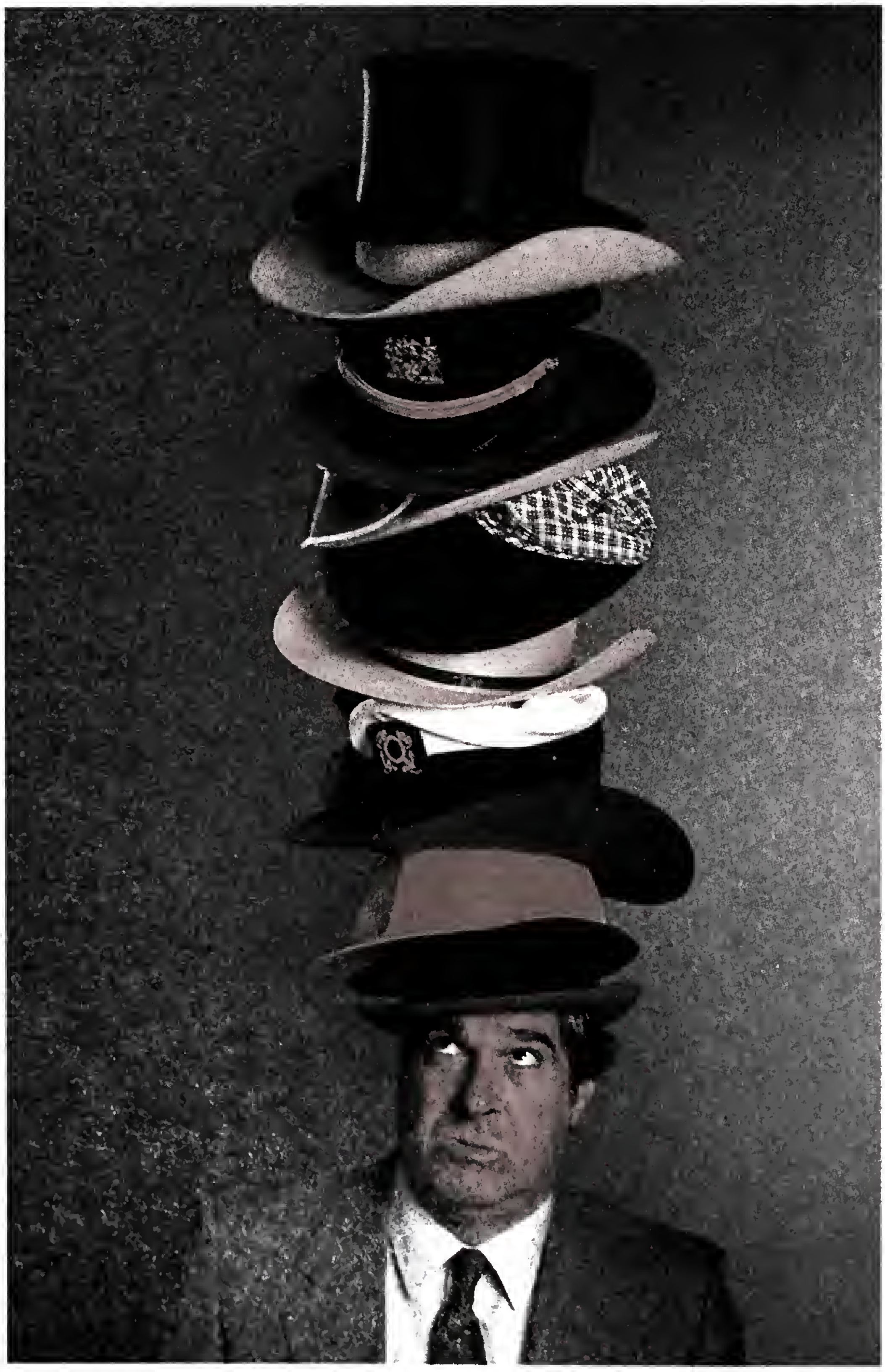

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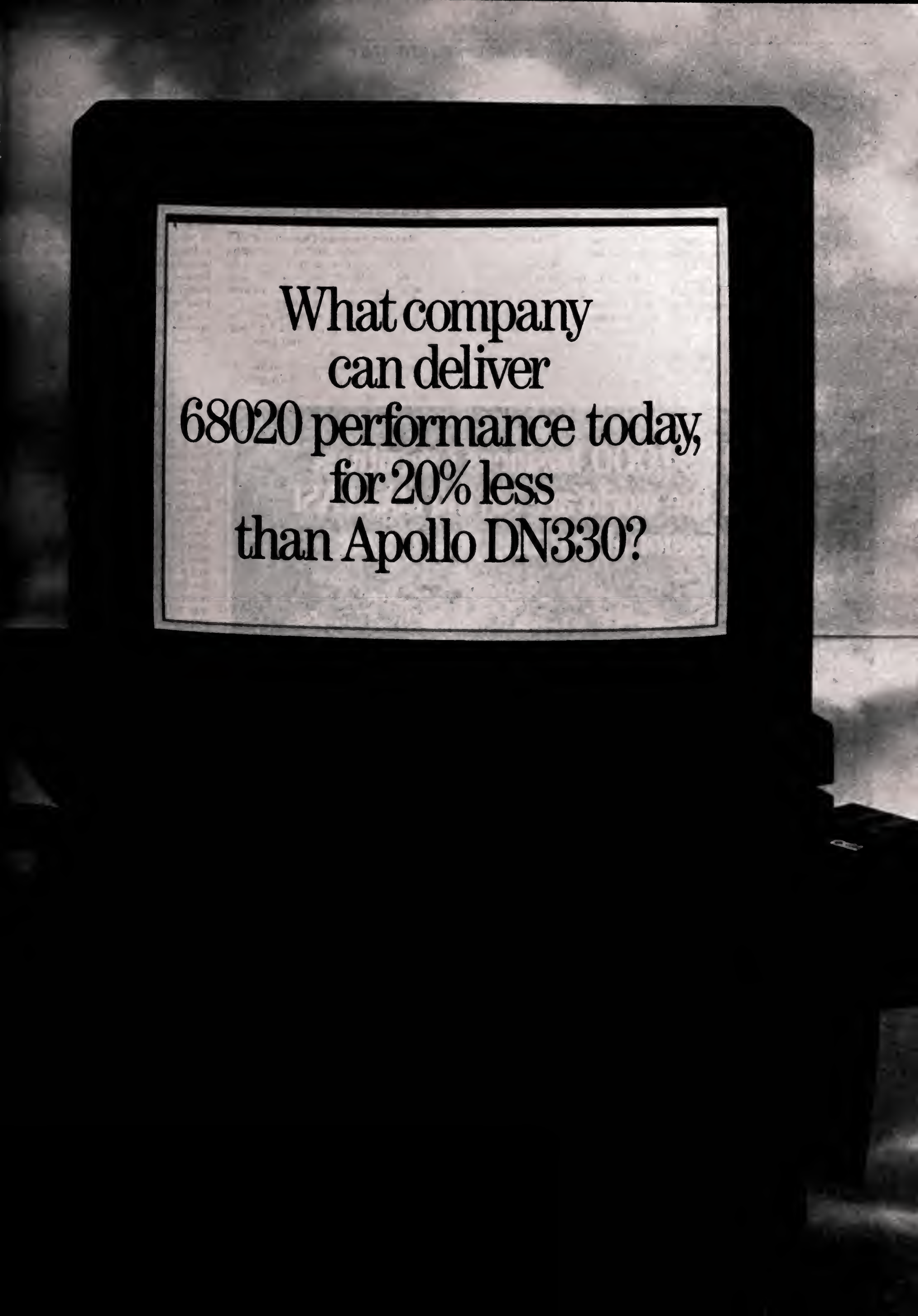
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DIMES

from page 124

enue for the second quarter of $1.4 million, compared with $4.3 million in the like quarter one year ago. The company reported a net loss of $3.4 million, or 10 cents per share, compared with a net loss of $59.3 million, or $1.57 per share, in the corresponding quarter one year earlier.

■

Timeplex, Inc. announced revenue for the year ended June 30 of $96 million, an increase of 45% over the fiscal 1984 revenue of $66 million. Profits were $10 million, or $1.15 per share, compared with $1.1 million, or 13 cents per share, in the same quarter last year.

Revenue of $26.3 million for the fourth quarter of fiscal 1985 increased 36% over $19.3 million for the same quarter a year ago. Quarterly profits were $2.4 million, or 28 cents per share, compared with $1.9 million, or 22 cents per share, in the comparable quarter last year.

■

Network Systems Corp. reported revenue for the second quarter ended June 30 of $24.3 million, up 51% from $16 million a year ago. Profits for the quarter were $5.3 million, or 18 cents per share, compared with $3.4 million, or 12 cents per share, one year ago.

■

Endata, Inc. announced second-quarter revenue results of $12.8 million, compared with $12.4 million in the corresponding quarter last year. Net income was a loss of $354,000, or 8 cents per share, compared with profits of $581,000, or 14 cents per share, in the comparable quarter one year earlier.

■

Computer Memories, Inc. reported revenue for the first quarter of fiscal 1986 of $50.5 million, an increase of 164% over $19.1 million in revenue for the comparable quarter last year.

Profits were $4.8 million, or 43 cents per share, an increase of 408% over $948,000, or 9 cents per share, in the like period one year earlier.

■

Masstor Systems Corp. reported a net loss of $3.4 million, including $2.5 million in operating losses, in its second quarter ended June 30, compared with a net loss of $5.3 million in the same period a year ago.

Second-quarter revenue rose to $8.1 million, compared with $4.7 million the second quarter last year.

■

Archive Corp. announced profits of $15.8 million for the third quarter ended June 28, an increase of 55% from the $10.2 million reported a year ago.

Profits for the quarter were $383,000, or 4 cents per share, from the $636,000, or 6 cents per share, reported a year ago.

■

Research, Inc. reported a 233% increase in profits for the fiscal year ended June 30 of $19 million, or $1.98 per share, compared with $5.7 million, or 69 cents per share, in the corresponding period one year ago. Revenue was $138.6 million, compared with $63.8 million in the prior year's quarter.

Fourth-quarter profits were $6.7 million, or 61 cents per share, on revenue of $42.4 million, compared with profits of $1.7 million, or 20 cents per share, on revenue of $23.8 million in the comparable period one year ago.

■

Seagate Technology, Inc. reported profits for the fourth quarter of $712,000, or 1 cent per share, including a tax benefit of $1.7 million; in the year-earlier period, the company reported profits of $10.5 million, or 22 cents per share. Revenue was $71.8 million, down from $100.5 million in the like quarter last year.

Despite a pretax loss of $10.2 million for the year ended June 30, net profits were $1 million, or 2 cents per share, including a tax benefit of $11.3 million; in the previous year, net profits were $39.4 million, or 84 cents per share. Revenue for the year was $214.6 million, compared with $343.9 million the previous year.

■

Xicor, Inc. reported revenue for the second quarter ended June 16 of $6.5 million, compared with $8.6 million last year. The firm posted a loss of $4.6 million, or 40 cents per share, compared with a net income of $1 million, or 9 cents per share, in the same quarter one year ago.

■

VLSI Technology, Inc. announced second-quarter revenue of $19.6 million, compared with $17.6 million a year ago. Profits for the quarter ended June 30 were $115,000, or 1 cent per share, compared with $2 million, or 10 cents per share, in the comparable period one year ago.

■

Duquesne Systems, Inc. reported revenue for the third quarter ended June 30 of $2.9 million, up 48% from $1.9 million for the same period a year ago. Profits for the quarter were $563,000, or 26 cents per share, compared with $390,355 or 19 cents per share, in the like period a year ago.

■

Tseng Laboratories, Inc. announced revenue for the second quarter ended June 30 of $719,982, a 33% increase from $539,828 in the same period one year earlier. Profits for the quarter were $82,385, or 5 cents per share, compared with $58,235, or 2 cents per share, in the corresponding period last year.

■

IPL Systems, Inc. reported a loss of $471,000, or 9 cents per share, on revenues of $520,000 for the quarter ended June 29. A year earlier, the company reported a loss of $2.3 million, or 46 cents per share, on revenue of $1 million.

■

Cambex Corp. reported a net loss of $383,000, or 20 cents per share, compared with profits of $71,000, or 4 cents per share, in the same quarter

See DIMES page 130

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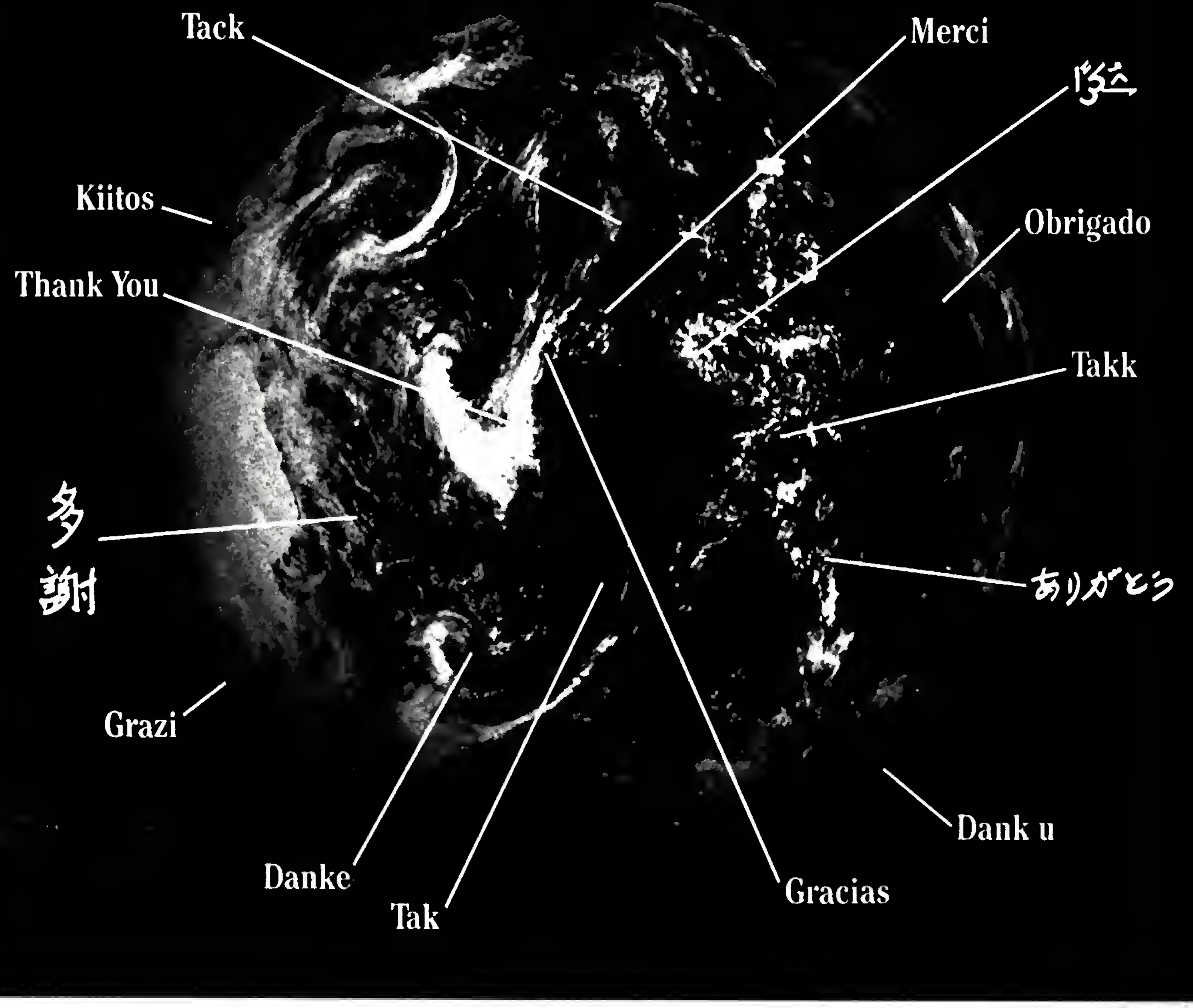

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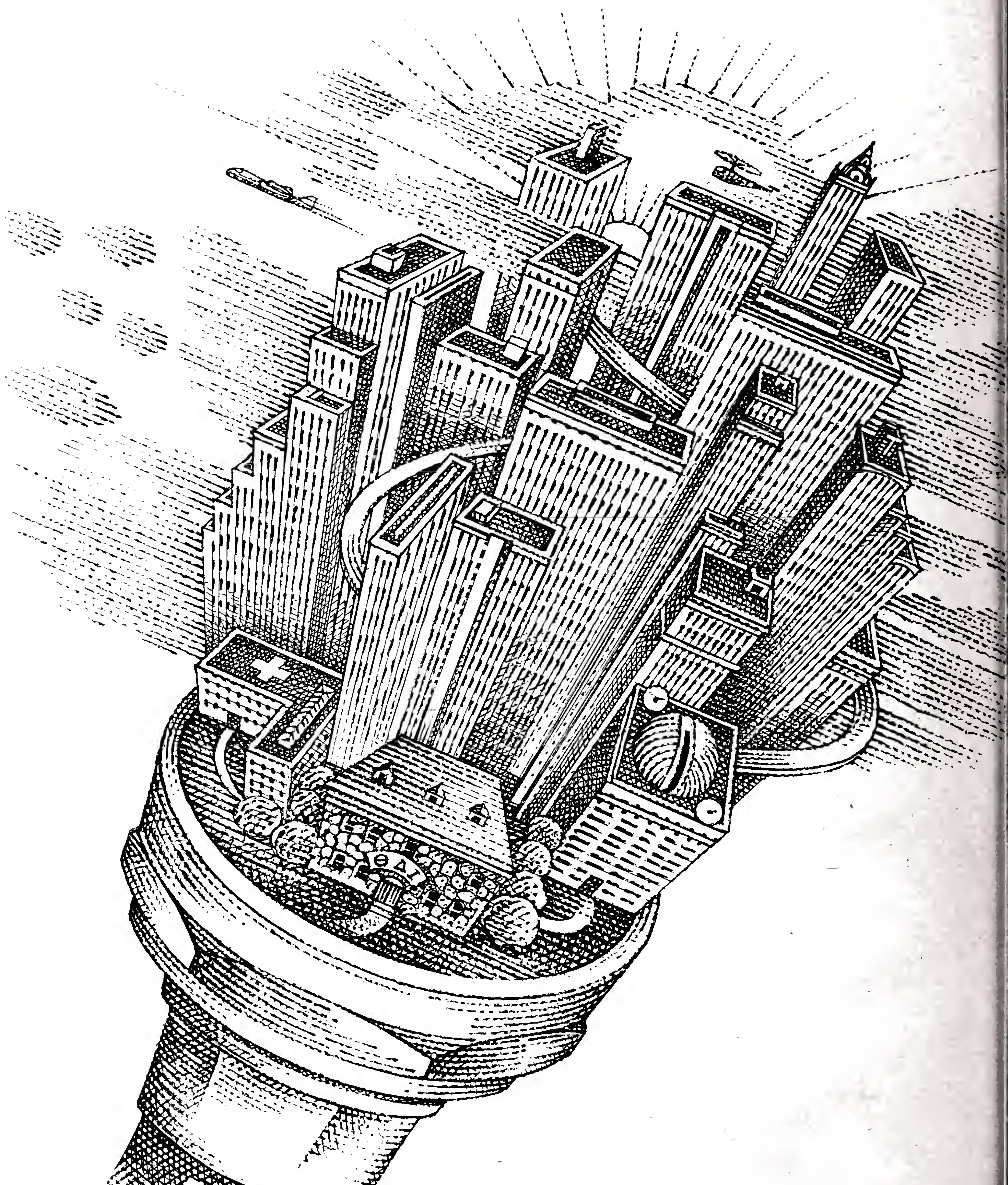

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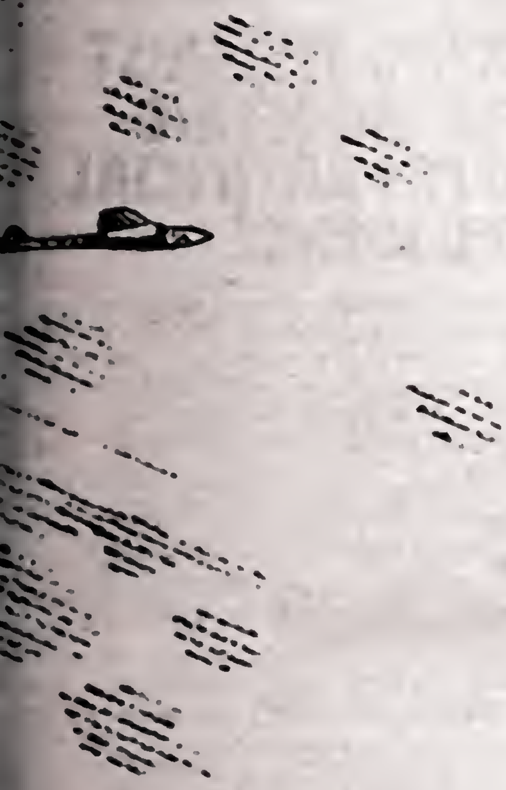

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DIMES

from page 126

last year. Revenue was $103.1 million, compared with $1.5 million last year.

■

GTE Corp. reported profits for the second quarter totaled $285 million, or $1.33 per share, compared with $283 million, or $1.41 per share, in the same quarter last year. Revenue was $3.9 billion, compared with $3.6 billion a year ago.

■

Systematics, Inc. posted revenue for the year ended May 31 of $95.9 million, compared with $78.7 million last year. Profits were $8.6 million, or 79 cents per share, compared with $6 million, or 56 cents per share, in the previous year. Fourth-quarter revenue was $26.9 million, up 30.2% from $20.7 million in the same quarter last year. Profits were $2.6 million, or 24 cents per share, compared with $1.7 million, or 15 cents per share, in the like quarter one year ago.

■

Nashua Corp. reported profits for the second quarter ended June 28 of $3.9 million, or 81 cents per share, compared with $6.2 million, or $1.31 per share, last year. Revenue was $153.9 million, compared with $146 million reported in the second quarter of last year.

From page 115

Downturn seen in service bids

for more than two years, after the company made the strategic decision to try and capitalize on the service organization it built to maintain its own products [CW, March 5, 1984]. With hardware prices declining and equipment becoming more dependable, asset utilization requirements essentially dictate that systems vendors attain higher service force productivity by maintaining equipment sold by other vendors.

The $179 million that Bell Atlantic Corp. paid last year for Management Assistance, Inc.'s Sorbus, Inc. service division and the $177 million bid that TRW, Inc. recently [CW, Aug. 26] offered for the Intelogic Trace, Inc. service spin-off of Datapoint Corp. have added impetus to the race to build nationwide organizations that can service integrated systems incorporating equipment from many vendors.

Prices outpace value

But in Charlton's view, those prices have outpaced the value of the acquisitions. "At some point, the law of supply and demand will take hold, and the value of these deals will get back to a realistic level."

TRW's recent offer could prove to be a problem for a company that has traditionally expanded through acquisition, according to Charlton. By bidding up the cost of such deals, TRW may actually make its long-term acquisition strategy too expensive, he speculated.

Some consolidation in the burgeoning service industry is inevitable, according to Charlton. But he said he thinks greater attention will be devoted to the actual profit and loss potential of the acquisition target.

Complete service

The ultimate goal of the leading tier of service companies is to be able to establish a nationwide organization capable of offering complete maintenance service to any particular business. All major vendors — even IBM to a limited extent — are moving toward offering complete service for equipment tied into their own proprietary products.

Among the large vendors, Control Data Corp., Sperry Corp., NCR Corp. and even AT&T have moved into or are exploring the profit potential of integrated service.

Charlton said that, given the continued performance and dependability of hardware, "service companies will be transitioning to software support, networking and communications support, as opposed to hardware."

Although service of large numbers of commodity machines, such as microcomputers, will always be selected based mainly on pricing, the service of integrated information systems is increasingly selected based on the ability to obtain on-site service and keep the system running, he said.

No easy feat

Putting together a nationwide organization capable of servicing varied software in large businesses is no easy feat, however. Honeywell's approach, according to Charlton, is to build up to that capability.

One key aspect, he said, is developing agreements with value-added resellers to provide complete service for the integrated systems those suppliers provide.

In addition to third-party agreements signed with more than 40 hardware suppliers, the Customer Services Division has signed up more than 50 value-added resellers, distributors and dealers that offer their customers Honeywell service contracts. Another aspect of the Honeywell strategy is its nationwide remote diagnostic service, which is much more effective for dealing with software service than hardware service, according to Charlton.

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From page 119

Mergers, acquisitions on the rise

services and software industry's 35-year history has seen few, if any, significant failures.

There remain several thousand companies that fall into the less than $10 million revenue class. Although these smaller firms have provided a comfortable living for their founders and have continued for 15 or 20 years as reasonably stable enterprises, current market conditions are forcing drastic changes in the way these companies operate.

These firms are major acquisition targets for the last half of the 1980s, as their founding entrepreneurs begin to examine methods of achieving liquidity and diversification of their portfolios.

The industry as a whole is alive, vital and growing in importance annually. Continued consolidation through the merger and acquisition process will help keep it so for the remainder of this decade.

From page 115

Lotus position inconsistent

to selling semiconductor manufacturing and fabrication equipment overseas comes not from the Japanese, but from the U.S. government.

Because of U.S. Department of Defense security regulations, any export of new, sophisticated chip making technology requires the acquisition of a license for the particular buying country. That translates into the inevitable delays of the bureaucratic red-tape labyrinth — up to 18 months in many cases, according to Hansen. And we're not talking about sales to Libya or Iran but to France, Japan and other allies.

The DOD obviously can't regulate everybody, so it is a simple process for the buying nation to obtain similar technology from someone else — a West German vendor, for example — rendering the security risk issue essentially moot.

"When we're trying to compete against a country, Japan, whose government subsidizes its companies, the actions of our own government are really counter to our efforts," Hansen said.

■

Although Franklin Computer Corp. of Pennsauken, N.J., appears to be climbing back admirably from the depths of Chapter 11 protection under the Federal Bankruptcy Act, its unbridled press release optimism seems a little premature. In a recent public relations document, Franklin Chief Executive Officer Morton David talked about "embarking on the adventure of the second wave of growth in the personal computer market."

The adventure part seems credible enough, if adventure means not being exactly sure where those stormy seas will take you. If nothing else, the past and present computer industry shakeout should have sobered everyone into a more realistic view of future demand, growth rates and customers' real needs.

But the implication that the next computer boom is just over the horizon sounds ominously like the would-be computer gurus of the early 1980s who are busy eating their words — and going into consulting.

From page 115

GEM buoys Digital Research

to be profitable.

Rowley predicted that, in the U.S. market, Digital Research's future system software revenue figures will be roughly flat, with growth coming in the applications market. "GEM brings us right into the mainstream of the IBM environment," he said. "Our target market is the Fortune 2000."

In this arena, "an absolute trend is that the information center and the DP manager are getting control of purchasing," he noted. Digital Research currently is finalizing details for a number of site licensing options, which will be released this month.

The firm has demonstrated GEM to the 50 largest corporate users of personal computers, often in conjunction with IBM, he said. IBM's National Accounts Marketing Division "has worked closely with [Digital Research] since we introduced the product."

IBM's reported offer downplayed

Rowley downplayed recent press reports that IBM prepared to offer GEM as a third-party product and then withdrew that endorsement. The two firms have signed an agreement covering a number of software offerings, he said. "The products that do compete are [Digital Research's] Concurrent PC-DOS and Topview," he remarked. "If there's any problem, that's what it is."

The development deal announced last month between IBM and Microsoft Corp. for future Personal Computer system software products simply "reports an extension to a five-year contract," Rowley suggested. "In terms of its impact on us, that's already been felt."

At present, 17 firms have signed OEM agreements for GEM worldwide, and 65 independent software vendors are developing packages for the GEM environment. Rowley estimated that about 100 GEM applications will be available by December, with at least half coming from European firms.

Digital Research will ship two additional GEM applications, GEM Wordchart and GEM Graph, in October, while several other products are well along in development.

"The next generation of software will move heavily into the graphics enhanced segment," he said. "Data bases and spreadsheets are logical targets."

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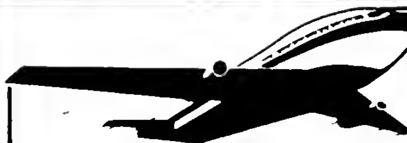

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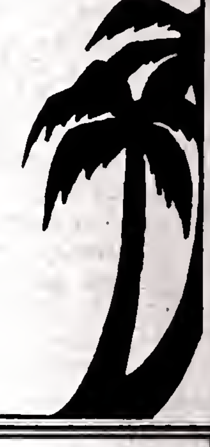

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Software Engineer: Work in Research and Development Department to generate structure codes, both in Assembler and high level languages, from pseudo language design for advanced PC software. Also responsible for providing software support and user enhancement as well as hardware configuration and testing for in house and new sales. Must be familiar with FORTH and Assembler languages, must have Electrical Engineering background, knowledge of microprocessor application and interface and interactive computer graphics. 6 years college, M.S. degree in Computer Science with 3 months experience as Software Engineer or 3 months experience as Senior Programmer. 40 hours/wk. 9 A.M. to 5 P.M., salary $23,000 per year. Contact or send resume to Job Service of Florida, 3421 Lawton Rd., Orlando, Florida 32803, (305) 423-6350. Job Order #3832732.

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Robert Half, staffed by EDP professionals for EDP professionals with 80 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1948 also makes Robert Half the oldest. One call and you can search the local, national and international markets ..... ALL FEES ARE PAID BY CLIENT COMPANIES, OF COURSE. The following is a partial listing of opportunities and locations.

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Exclusive opening with CT client expanding MIS projs! Indiv must have min 8 yrs exp w/emphasis on IMS DB/DC design/devel projs. Demonstrated mgmt exp req'd for this newly created pos. Salary to $60,000

NETWORK PERF

Telecomm's expansion has created need for "performance" function to measure & optimize all resources to meet corp standards! Exp w/ hdwr/sftwr perf tools highly desired for this multi-vendor network. Salary $35-45,000

SOFTWARE SPECIALIST

Multiple CT oppty's for IBM/8100 tech indiv's to join data ctr expansion of distributed proc systems. Excellent growth oppty for indiv's seeking mgmt respons. Salaries to $44,000+

CICS SPEC

CT multi-div corp expanding CICS functions! Min 4 yrs CICS internals qualifies for sr tech spot. Full reloc paid. Salary to $42,000

PROGRAMMER ANALYSTS

CT corp has immed need for P/A's w/min 2+ yrs COBOL apps exp! Client pays full interview & reloc expenses. Prefer IBM/MVS bkgrd. $25-32,000

DIRECTOR MIS

Min 10+ yrs exp in health care/ins qualifies for newly created position. Indiv will build own staff, develop new on-line HMS linking multiple locations. SUNBELT loc. Salary to $65,000

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(203) 278-7170

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International company looking for 4 years COBOL, IBM OS with 2+ years CICS or IMS. Low $30's

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Multi System 38 shop needs 2+ years RPGIII and System 38 experience. Low $30's

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(615) 361-4900

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MVS INTERNALS

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Minneapolis, MN 55402
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Tulsa, OK 74145
(918) 627-1600

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(402) 397-8107

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(212) 221-6500

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PROG/ANALYST

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Scott McCullough
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of Austin
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Austin, TX 78752
(512) 835-0883

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ANALYST

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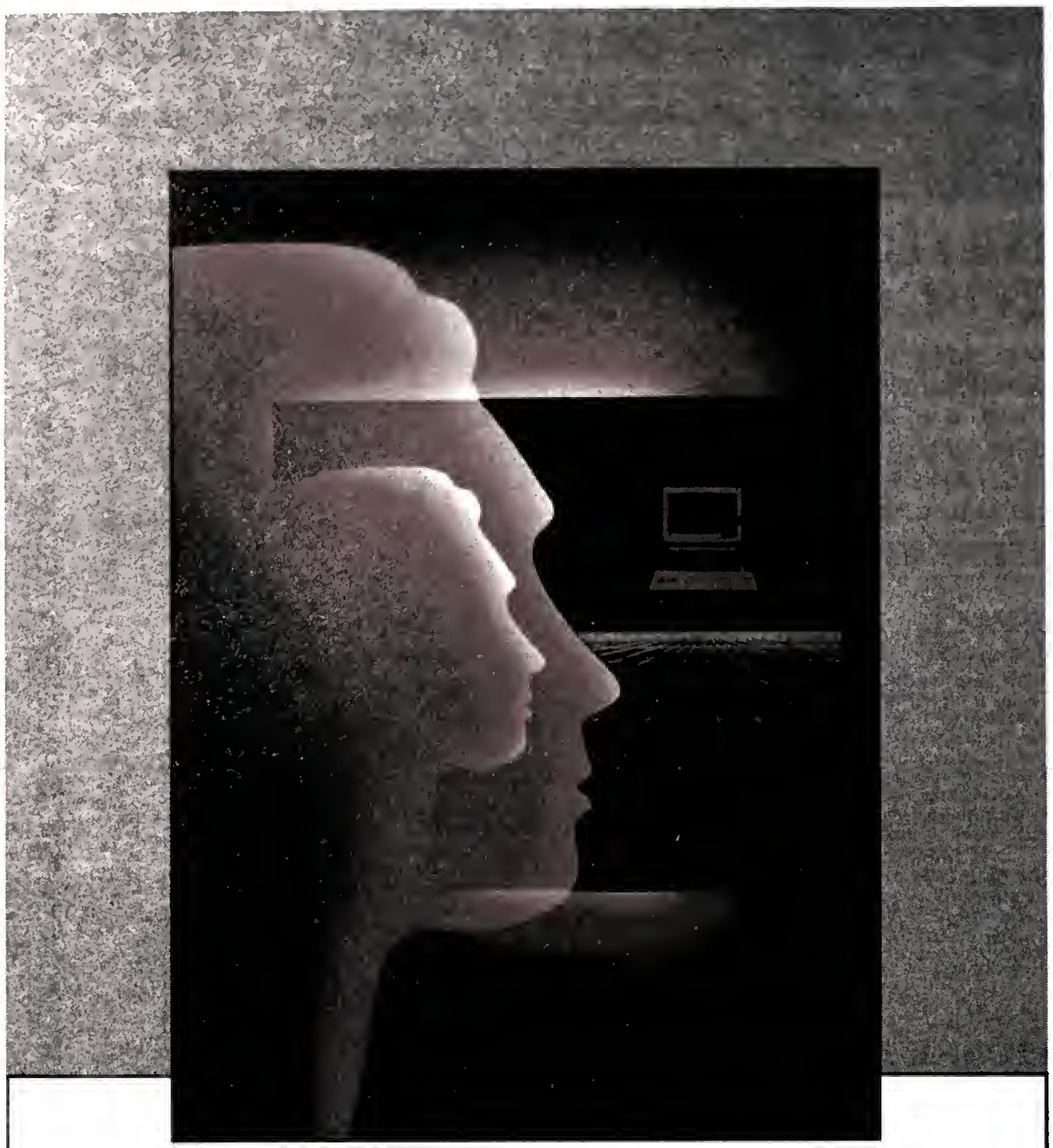

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If you like to read PC technical journals, only to find that others are just discovering what you already know, if you know the DOS Technical Reference backwards and forward, if you consider your technical knowledge underutilized and unappreciated, and if you are tired of handholding spreadsheet users and explaining simple things over and over again to "programmers", then we can challenge you.

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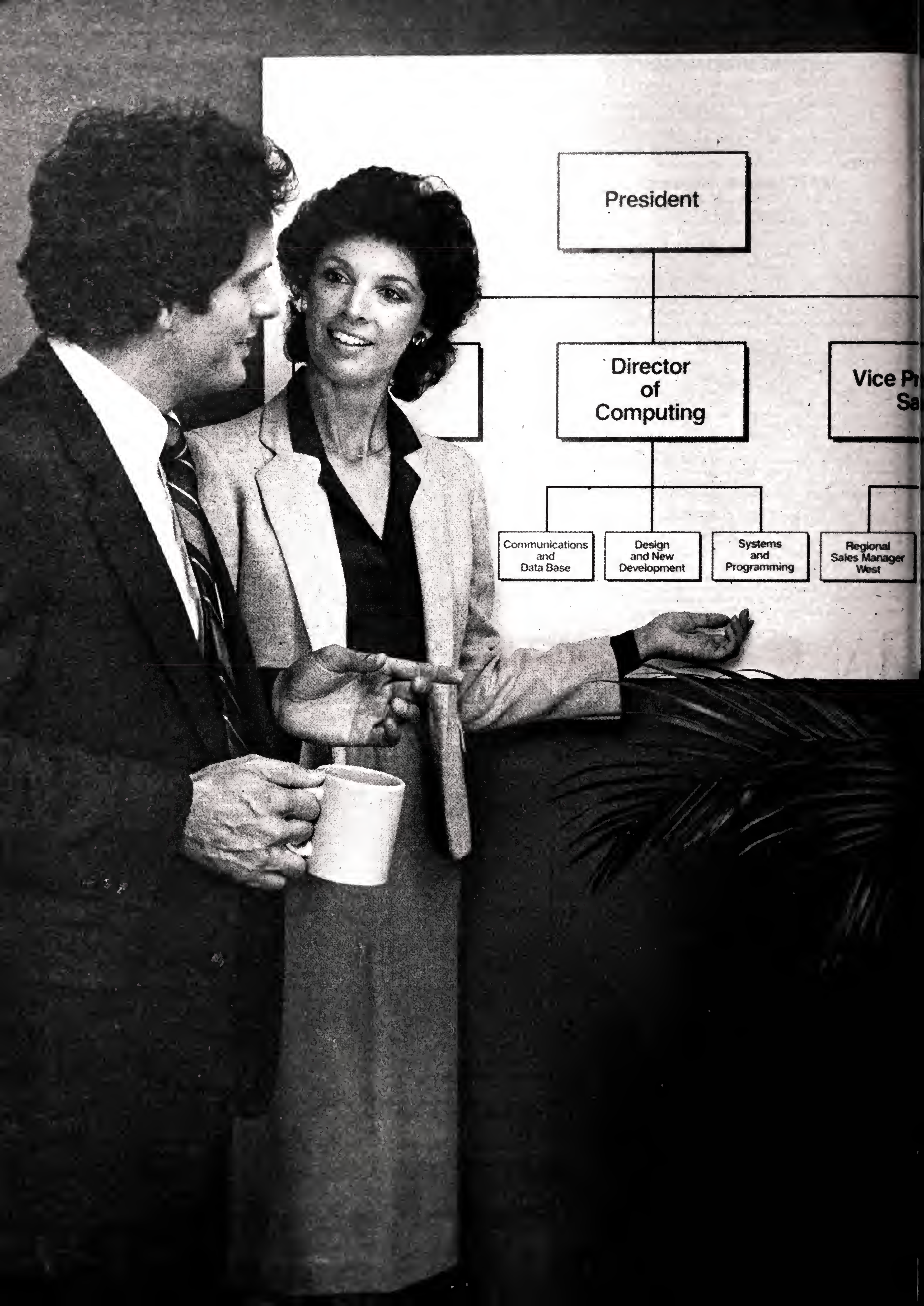
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Those with two or more years experience in applications programming will have an opportunity to learn new skills while ensuring maximum compensation. Positions exist in environments ranging from the largest scale mainframes through mini and microcomputer user, consulting and vendor firms.

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Software Development/ Software Engineering
$28,000 – $60,000

Individuals with two or more years of software design and development or software engineering experience will be able to gain experience in and develop some or all of the following: operating systems, capacity planning and performance enhancement tools (OMEGAMON, MEAGAMON), compilers (C, PASCAL, ADA), I/O and device handlers and program generation tools. This development work will take place on a variety of systems including IBM 3083's, VAX 11/780's, Tandem Non-Stop, and variety of other mini and micro systems (Motorola 68000, Intel 8080's).

Many of the companies participating in the Conference offer formal training and experience in leading-edge technology as well as day-to-day contact with some of the top technical professionals in the country. A number of opportunities with new venture companies offer exceptional growth and equity potential.

Data Base/Data Communications
$25,000 – $55,000

Many openings exist for individuals with backgrounds in database and/or data communications. Exposure to a variety of technologies is possible, including: IMS DB/DC, ADABAS, IDMS, TOTAL, FOCUS, CICS, ENVIRON/1, TCAM/NCP, SDLC, SNA, X.25 and other database and/or data communications software.

Companies participating in the Conference include major computer and software manufacturers, Fortune 500 companies, prestigious consulting firms as well as many emerging high technology firms.

Systems Programming
$24,000 – $55,000

Opportunities provided by client firms that are participating in the Conference are broad and unique. Those with at least one year of systems programming experience will be able to strengthen their skills as well as gain knowledge of some or all of the following: UNIX, CPM, CICS, IMS, OS/VS, DOS/VS, ADABAS, DL/1, modems, duplex lines, switches, and more in both mainframe and mini or micro environments. Assignments range from program development and enhancement to systems support.

EDP Auditing
$25,000 – $58,000

Exploding opportunities exist in EDP auditing. There are many openings for those professionals who have a good technical background in programming or design plus exposure to accounting applications. Large firms are expanding their EDP auditing departments and are providing specific training in auditing for Programmer Analysts—particularly those with over two years experience.

Technical Writing
$21,000 – $38,000

Those Technical Writers/Documentation Specialists who have writing experience with state-of-the-art hardware and software are now in a position to capitalize on those skills due to high demand. Positions range from creating technical documents for users to the development of marketing and sales brochures for new products. Because of the growth of new hardware products and new software packages, the need for good technical writers has grown rapidly. In addition to a great need for creative writing, there are also many opportunities for the more senior level writers to become Technical Writing/Documentation Managers.

Systems Development/ Management Consulting
$31,000 – $78,000

A broad variety of openings exist for persons with systems design and development backgrounds ranging from systems analysis to senior project management and/or management consulting. Many leading-edge communications and data base-oriented information systems projects are being planned by Conference client firms. In addition, a number of small to intermediate size firms are just beginning to make their initial thrusts into computing—especially in mini/micro areas—and need new applications development expertise. Several nationally-respected management consulting firms will also be represented for those persons who are interested in a variety of new development assignments with high visibility to corporate management.

Sales, Marketing and Technical Marketing Support
$23,000 – $108,000

Those professionals who attend the Conference will learn about new opportunities in computer sales, marketing and marketing support. Many alternatives exist in various product areas including mainframes, mini/microcomputer technology, terminal systems, time-sharing, facilities management, proprietary software packages, OEM's, consulting and more. Many firms are just now entering new markets and will provide exceptional career and compensation growth potential—as well as equity participation.

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The Scholarships are tenable for one year in the first instance and, subject to satisfactory progress, renewable annually for another two years

The value of each Scholarship ranges from S$800 to S$1,100 per month (U.S. $1.00 = S$2.20 approximately) and is not subject to income tax; the actual emolument is determined by the candidate's qualifications and experience. No travel or other allowance is provided

Research Scholars may be asked to assist in the work of the Departments to which they are attached for not more than three hours a week They will be remunerated for the work done.

The University will help Research Scholars find off-campus accommodation.

Application forms may be obtained from:

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NATIONAL UNIVERSITY
OF SINGAPORE
North American Office
780 Third Avenue, Suite 2403
New York, NY 10017
United States of America.

THE REGISTRAR
NATIONAL UNIVERSITY
OF SINGAPORE
Kent Ridge
Singapore 0511
Republic of Singapore.

In your request for application forms, please state:
(a) the field of research you intend to undertake; and
(b) your highest educational qualification.

Applications must be received by The Registrar, National University of Singapore by 31 OCTOBER 1985.

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With these advantages	Respect for creative solutions, an environment of thorough professionalism, excellent salaries and comprehensive benefits. To explore your potential here, please send resume with salary history, to Mr. David Trojnar, Employee Relations, Ref. 48-C, General Electric Company, Silicone Products Division, Waterford, NY 12188.

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The ideal candidate will have a minimum of an AS degree and 3 plus years experience as a Programmer Analyst in a manufacturing company. Additional background should include RPG III language proficiency in an IBM System 38 environment and a knowledge of accounting and cost analysis systems Position offers an above-average salary, full range of company benefits and an attractive relocation policy and the opportunity to participate in a dynamic results-oriented corporation.

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Employee Relations Department
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BiC

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In order to qualify you must have had at least 5+ years of solid data processing experience, with a proven track record of advancement from equipment operating through hardware planning and analysis for a large computer installation, (e.g. IBM 303x through 308x installations). Must possess strong analytical background along with both good oral and written skills

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For confidential consideration, please forward your resume along with salary history to: Zayre Corp., Technical Recruiting Department, Speen Street, Framingham, MA 01701. Selected candidates will be contacted by 10/10/85. An equal opportunity/affirmative action employer.

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Requires expert knowledge of current EDP hardware/software develop. techniques incl. Data Base Retrieval, Modular Programming, Decision Logic Tables, Structural Programming; IBM 37 and 4300 hardware experience; proficient in COBOL, familiarity with RPG II, DL/I; CICS/VS application design and programming experience, familiarity with DOS/VSE, DOS/VSE JCL; extensive VSAM, DOS/VSE experience; US Civil Service (GS-12) level or 5 years' comparable experience; BS in Computer Science or Math desired, but practical experience will be considered.

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Requires expert knowledge of current ADP software development techniques; IBM 37 and 4300 hardware experience, proficient in COBOL programming; familiarity with RPG II and Assembler; min. 5 years' ADP programming experience; CICS/VS application design-/programming experience; thorough knowledge of DOS/VS and major user utilities; hands-on DOS/VS JCL experience, extensive ISAM experience with VSAM desirable; US Civil Service (GS-12) or comparable experience, BS in Computer Science or Math, but practical experience will be considered.

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Engineering

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- 4 years' QA & Integration Test experience
- AFR 300-15 & DoD STD 7935
- Large Scale Systems Design & Programming knowledge preferred

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- 9 years' experience in the technical & administrative areas of DoD LOGISTICS/SUPPLY DISTRIBUTION

Training
- BS/BA Education or related
- 3+ years' adult education & training material development

CM/DM
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- Familiarity with MIL-STD 480, 483 AFR 300-15, DoD STD 7935

All positions require a BA/BS degree in CS, Math, EE, or related field and 2-6 years experience. We offer competitive salaries, excellent benefits and career advancement in a highly visible environment. Qualified candidates should send their resume with salary history in confidence to **Cathy Kimmel:**

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Defense Systems Division

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The UACN provides the statewide University of Alaska campuses Computing and Data Communications services with an extensive Infotron-based asynchronous network. DEC, IBM, and other hosts are linked in this and an embryonic SNA network. The Manager is responsible for evaluation, coordinating, and supervising the operations, maintenance, enhancement, and planning of these network facility and support staff.

The successful candidate must provide technical competence in communications network architecture, engineering, local area network, data communications as well as demonstrated ability in the management, planning, operation, development, and maintenance of large data communications networks. Some Alaska and out-of-state travel will be necessary.

This position will reside at the Fairbanks campus, which is the state primary residential institution. Fairbanks, located in the interior of Alaska, offers a variety of historical, cultural and year round activities. The spirit of adventure is still alive in Alaska.

Closing date: September 30, 1985

Interested individuals should submit a cover letter, resume and three references to:

**State Wide Office
Of Human Resource Development
Room 1, Bunnell Building
University Of Alaska
303 Tanana Drive
Fairbanks, AK 99775-6400**

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---

500 DP Openings

[illegible]

Rick Young, CPC (704) 366-1800

Corporate Personnel Consultants, Inc.
3705 Latrobe Drive, Suite 310
Charlotte, N.C. 28211

PROGRAMMER/ANALYST AND SYSTEMS ANALYSTS

A medical center located in the historic Chattanooga, Tennessee area is beginning the second phase of its long range data processing plan. Several growth opportunities are available for dedicated data processing professionals interested in the professional challenge of implementing state-of-the-art, on-line data base systems utilizing COBOL programming and transaction processing technology. Our newly constructed data center includes dual 24 MEG Burroughs B7900's, mini computers, micro computers, and office automation systems. We offer the opportunity to expand your technical and professional skills in a progressive health care setting.

Our requirements are for individuals with 2 years experience on medium to large-scale batch and on-line systems. We seek above average skills in communications, organization, sensitivity to end user needs and a stable employment history. Burroughs and Health Care backgrounds are required.

PROGRAMMER/ANALYST

Assignments include detailed program design, coding, testing and debugging, as well as documentation and implementation of batch and on-line systems. You will assist in the system specifications, design tasks, and end user training. At least 2 years of heavy experience in COBOL program design, coding and testing. Familiarity with Assembler language programming, micro and mini computers a plus. Salary $26,500 (JOB ORDER # TN5552718 — Be sure to specify this in letter of application)

SYSTEMS ANALYSTS

You will serve as liaison between users and the data systems department. Responsibilities include specification, design and installation of financial and patient care system. You will oversee programmer analysts with hands-on implementation experience with custom and application packages involving data base and data communications and the ability to handle multiple projects. A Bachelor's degree and programming background required. Salary $32,000 (JOB ORDER # TN55517 — Be sure to specify this in letter of application)

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  Will plan and implement MVS/XA conversion Will also provide technical support for MVS/SP including installation, maintenance and problem determination Could support VM and VSE
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  Will assist in installation, maintenance and problem determination of MVS/SP Will assist in conversion activity for MVS/XA
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  Will provide primary support for planning and implementing CICS and evaluating system performance Will direct and monitor the work of others

Our environment includes Amdahl 470 V8's and 580 with MVS, VM, VSE, JES2, TSO/ISPF, ACF2, MSI, CICS, SMP, DPF and ROSCOE

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Central and South West Corporation
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SYSTEMS PROGRAMMER/SENIOR

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EDP AUDIT PROGRAMMER POSITIONS

COAST TO COAST SUNBELT AND OVERSEAS

All positions fee paid also free resume preparation and career appraisal. Call (305) 491-7971 or write:

Professional Search Associates
5200 N. Federal Highway #2
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Programmer Analyst - design and develop applications, testing and procedures using IBM 4300 running under DOS/VSE and programming in COBOL. Must be familiar with CICS, VSAM, EDF. $33,750 per year. BS in Computer Science or related area and 2 years experience. References. Job Order #NY8001430, DOT Code 020167018. Resume to NYS Job Service, 175 Remsen St., Brooklyn, NY 11201.

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Help us develop and manage a professional sales organization. We are a small rapidly growing $15M marketing driven manufacturer of IBM multi-vertical software packages. Our IBM VAR relationship is the key to our future strategy. Our opportunity includes stock participation, six figure compensation, vice presidential executive responsibility and entrepreneural freedom. Your credentials must include quota breaking sales management experience, mini-computer business software and turn-key sales. To explore this opportunity, please call Meryl Schaffer at (703) 642-1950 or direct your confidential resume to **Carlyn Computer Systems,** 5105Q Backlick Rd., Annandale, VA 22003

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National company with major division in third party computer systems sales and leasing needs Manager to direct the activities of this division with opportunity to build your own departmental staff. Attractive salary with good incentive participation. Must have prior IBM product knowledge. Sperry systems knowledge helpful. Must be willing to relocate in Southeast. If qualified, call S. S. PEARL

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Is a specialized United Nations Agency located in Geneva, Switzerland. The ITU has vacancies for:

SYSTEM ANALYSTS AND PROGRAMMERS

To work in systems design and implementation of transaction driven database applications. The posts are for a minimum of two years, starting early 1986. Applicants should have a background corresponding to a University degree plus suitable experience (preferably in an IDMS environment). Experience in database design and implementation would be an advantage. For one of the posts, experience in computer graphics is necessary. Net remunerations and allowances will be in accordance with United Nations rates.

Advertised posts are open equally to women and men.

Closing date for applications is 15 November 1985. Applications should quote Reference No. FMS-85-6, and should be sent to:

The Personnel Department
International Telecommunication Union
CH-1211 Geneva 20
Switzerland

which will provide information on benefits including reimbursement of travel and removal, etc., upon request.

Information on job content may be obtained by telephoning:

(41 22) 99 53 15 (FMS SECRETARIAT)

SYSTEM MANAGER-IBM VM/SP

Dartmouth College, Hanover, New Hampshire, seeks a Systems Manager to direct the installation and operation of an IBM 4381 system running VM/SP. The manager reports to the Director of Technical Services and performs such specific duties as: generating and maintaining systems, troubleshooting, monitoring system performance, installing and maintaining utilities and applications packages from various sources, overseeing system administration, coordinating VM support with operations and user services personnel, and providing staff instruction and consultation.

Position requires a Master's degree in computer science or related field, with three to five years' experience on an IBM VM/SP system, or an equivalent combination of education and experience. Substantial project leadership experience and a demonstrated ability to communicate effectively, both orally and in writing, are required. Must be comfortable working as a member of a team of professionals.

Review of resumes will begin on September 15, 1985. Salary is negotiable. Please send resume to: Dartmouth College, Personnel Administration, Clement Hall, Hanover, New Hampshire 03755.

Dartmouth College is an equal opportunity employer with an affirmative action plan.

BANK SYSTEMS ANALYST

The Chittenden Bank has an immediate opportunity for an experienced professional to coordinate and support the implementation of data processing projects. This will involve working closely with all levels of management to develop technical specifications, interface with the programming department and monitor testing efforts during implementation.

Candidates must possess experience in systems analysis within a banking environment combined with two to three years of programming experience and project management skills. In addition, exposure to microcomputers helpful. Degree preferred.

Combine Vermont's quality lifestyle with the Chittenden Bank's quality work environment. Please submit resume and salary history and requirements to:

Chittenden BANK

The Chittenden Bank
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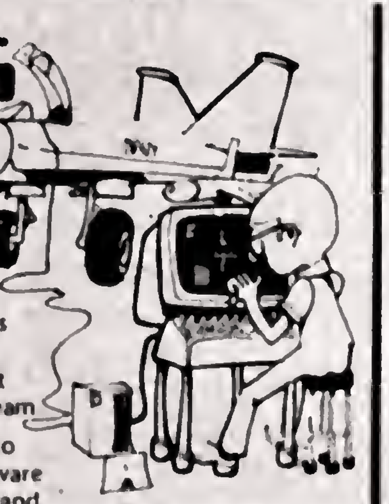
CJIS APPLICATION PROGRAMMER

El Paso Consolidated Data Processing is seeking an experienced IBM Programmer for their Inslaw Inc. Criminal Justice Information Systems (CJIS) project team. Two years CJIS or similar systems experience is required. This highly visible position has hands on responsibilities and extensive user contacts. Salary commensurate with experience. Fringe benefits include life and medical insurance, retirement plan, liberal holiday and vacation. Contact: Personnel Director, Room 221, City County Building, El Paso, TX 79901

SOFTWARE/COMPUTER ENGINEERS



The Naval Weapons Center, the Navy's major Research, Development, Test and Evaluation Activity located at the foot of the Sierra Nevada, is seeking experienced software professionals to join its Aircraft Software Product Assurance Team.

Part of the Center's mission is to develop new software and software revisions for in-service aircraft, and test and validate the software of developmental aircraft.

We are looking for candidates with BS or advanced degrees in engineering, computer science, math or other appropriate disciplines, who are interested in working with software support activities for front-line Navy/Marine Corps tactical aircraft, including the AH-1J/T, A-6E, A-7E, AV-8B and F/A-18.

Those with experience in the following areas should apply.

- SOFTWARE QUALITY ASSURANCE
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SALARY TO $45,000

Naval Weapons Center / ANN-092-3108-4 / China Lake, CA 93555
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City Polytechnic of Hong Kong invites applications for the posts of Principal Lecturer/Senior Lecturer/Lecturer in the following departments which are tenable from Summer/Autumn 1986:

DEPARTMENT OF COMPUTER STUDIES

Technical areas: COBOL, PASCAL, ADA, 4th generation languages, computer systems and architecture, data base, data communications, expert systems, systems analysis, design and development, network and graphics. Application areas: accounting, banking, education, engineering, finance, management, manufacturing, marketing, process control.

DEPARTMENT OF ELECTRONIC ENGINEERING

Communications, computer engineering, digital electronics, solid-state and microelectronics.

Candidates should possess a good honours degree or professional qualification in a relevant field. For senior appointments, candidates are expected to have a higher degree or an advanced specialist qualification. A minimum of 3, 8 and 13 years of relevant professional experience since obtaining the basic entry qualification, which may include years spent on higher degree studies and/or research, is normally required for appointment to the grades of Lecturer, Senior Lecturer and Principal Lecturer respectively. Experience in teaching or planning modular programmes and successful research/consultancy desirable.

Principal Lecturer:	HKD247,620 - HKD307,260 P.A. by 5 increments
Senior Lecturer:	HKD208,920 - HKD270,720 P.A. by 6 increments
Lecturer:	HKD112,740 - HKD199,680 P.A. by 12 increments

1 US Dollar: HKD7.782 (US Dollar equivalent as at 13.8.85) except for Principal Lecturer appointees who will be given an option of either a two-year or an extended four-year contract appointments will be made initially on two-year gratuity-bearing contract terms. A 25 per-cent terminal gratuity on basic salary received over the entire contract period is payable upon successful completion of the contract. Generous fringe benefits include medical and dental benefits, and where appropriate, leave passages, housing accommodation or housing allowance and education allowance for dependent children.

Applicants should send detailed resume together with names of two referees who should be able to comment on applicant's academic/professional suitability, particularly over the past 5 years, to: **THE GENERAL SECRETARY, CITY POLYTECHNIC OF HONG KONG, P.O. BOX 98441, TSIN SHA TSUI POST OFFICE, KOWLOON, HONG KONG** by 12 October 1985. Applicants should state clearly the grade on post applied for. Information regarding the polytechnic or on posts advertised may be obtained by mail upon request. Please note that applications received after the closing date may not be considered.

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- IDMS
- Batch COBOL and/or PL/1
- FOCUS, RAMIS, MARK IV
- System 38, COBOL and RPG

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Dallas, TX 75234
1-800-527-4907
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ROBERT HALF

FLORIDA POSITIONS

Senior Systems Analyst needed for Florida University's newly created position. Individual must have strong leadership and excellent communication skills with a BS degree. 4-6 years of experience in systems analysis required. A background of Cobol programming helpful with some managerial or supervisory exposure necessary. Work experience in a higher education facility a plus. This opportunity offers excellent benefits with salary to $35,000.

Orlando client needs VAX 11/780 Business Applications with Cobol programmers. Salary to $40,000.

Dorothea Sams

Robert Half of Orlando

P.O. Box 17892
Orlando, Florida 32860
(305) 628-2836

DIRECTOR OF PLANNING FOR COMPUTING

The Office of the Chancellor for the Southern Illinois University System seeks to fill a new position, Director of Planning for Computing. The Director will coordinate the development of Systemwide long-range plans for computing, Chair the Systemwide Computer Operations Committee, share responsibility for planning various joint hardware and software acquisitions, serve as liaison for technical assistance on Systemwide issues and problems, and staff computing initiatives undertaken directly in support of the Offices of the Chancellor and the Board of Trustees of Southern Illinois University.

Qualifications: A Master's degree and at least five years of related experience preferred. Individuals with a Bachelor's degree and extensive training and experience will be considered. Candidates must have experience with planning the development of management information systems and computer operations in a complex organization. Experience in higher education is desirable.

Appointment will be on a fiscal year basis. Salary range $42 - 48,000. Send resume and names of at least three references by October 4, 1985 to:

Thomas C. Britton
System Administrative Officer
Office of the Chancellor
Southern Illinois University
Carbondale, IL 62901

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Data Processing

SYSTEMS PROGRAMMING SUPERVISOR

Union Electric, one of the largest investor-owned utilities in the nation, has an immediate management opening for an experienced Systems Programmer.

You will work at our St. Louis corporate headquarters, in an IBM, MVS/XA, JES II environment. Your technical skills will be used to support CICS, SNA, VTAM and capacity planning. In addition, you will use your leadership abilities to assist and advise a team of Systems Programmers.

We require a B.S. in Computer Science or an equivalent degree, a minimum of 5 years' systems programming experience and competency in ASSEMBLER language programming. ADABAS experience is desirable.

Union Electric can offer excellent compensation and benefits plus the opportunity for rapid advancement. If you are ready to take the next step in your career, call TOLL FREE or send your resume and salary history to: **Bob Moeller, Employment Supervisor; UNION ELECTRIC COMPANY; P.O. Box 149; St. Louis, MO 63166. We are an equal opportunity employer M/F.**

CALL TOLL FREE 1-800-325-7454 or IN MISSOURI CALL 1-800-392-7327 Station 3266.

UNION ELECTRIC COMPANY

ASSISTANT DIRECTOR, COMPUTING SERVICES DEPARTMENT

The University of Arkansas at Little Rock has an immediate opening for an Assistant Director for Computing Services. The Computing Services Department provides central administrative and academic computing resources on a campus-wide basis currently using COBOL-based administrative applications and a large variety of languages, utilities and packages for instructional and research applications. Future planning includes the use of integrated software packages and multi-vendor networking. The Assistant Director reports to the Director, Computing Services Department. Major responsibilities of the above position include assisting the Director, managing the Administrative Applications Component (six or more professional staff members), and providing guidance and assistance in technical areas. The candidate must have management skills and should have current experience with administrative and academic computing in a large campus setting. It is preferred that the candidate have in-depth experience with systems analysis, COBOL programming, data base management systems and transaction processing. Honeywell DPS 8/44 with GCOS or CP/6 operating systems experience and/or Digital Equipment Corporation VAX 11/780 with VMS operating systems experience is also preferred. Salary commensurate with education and experience. Send vita or resume to: Earl Hilliard, Director, Computing Services, University of Arkansas at Little Rock, 33rd and University, Little Rock, AR 72204. Deadline: September 20, 1985. The University of Arkansas at Little Rock is an affirmative action, equal opportunity employer and actively seeks the candidacy of minorities and women.

MIS PROFESSIONALS

The Information Systems Division of HealthOne Corporation, a multi-hospital, diversified, health care delivery system, has the following key positions available for persons with appropriate experience and training.

Manager, Computer Operations, responsible for the management of HealthOne's two primary data centers through subordinate Data Center Supervisors. Will direct the efforts of approximately 30 Computer Operations, Production Control and Scheduling, and Customer Service personnel at two Twin Cities locations.

Physical environment includes IBM 4381 and 4341 host processors and numerous distributed Data General, Hewlett Packard, and Series I mini-computers. Current mainframe software includes VM, DOS/-VSE with CICS, VTAM, VSAM, VOLLIE, LIBRARIAN, DYNAM-T, DYNAM-D, and ZEKE.

General requirements include a working knowledge of IBM medium to large scale systems operating under VM and DOS/VSE. Experience with MVS is highly desirable. Must have five to six years of operations experience with at least three years of management experience. A Bachelor's degree in a related field is desirable.

Manager, Patient Management Systems, responsible for management of in-house analysts and programming personnel, contract programmers, software vendors, and consultants in order to successfully manage the delivery of patient accounting systems to multiple hospitals. Application software is MEDIPAC Patient Accounting and ADT with additional systems planned for 1985 and beyond.

General requirements include experience with healthcare business office systems and IBM medium to large scale systems. Hands on experience with MEDIPAC is highly desirable. Candidates should have a minimum of five to six years of experience demonstrating substantial responsibility for management at the project level and above. A Bachelor's degree in a related field is desirable. An advanced degree would be a plus.

Senior Systems Analyst, Patient Management Systems, responsible for major systems development projects within the Patient Management Systems department of HealthOne's systems development group. Work with end user managers and end users to define business requirements. Perform analysis and design activities to support programmers with systems specifications. Evaluate vendor product offerings against requirements.

General requirements include experience with healthcare business systems and IBM medium to large scale systems. Hands on experience with MEDIPAC is highly desirable. Candidates should have a minimum of four to five years of experience demonstrating two to three years systems analysis experience with a prior background in programming. A Bachelor's degree is preferred which may be offset by additional experience.

These positions will be attractive to persons whose qualifications match or exceed the requirements. We offer these positions in a challenging environment with competitive compensation and with an attractive benefit package.

To be considered for these positions, please submit your resume, with recent salary history to:

DIRECTOR MIS
HEALTHONE CORPORATION
900 SOUTH EIGHTH STREET
MINNEAPOLIS, MN 55404

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NO AGENCIES PLEASE

HP 1000
SYSTEMS PROGRAMMER

Travenol Laboratories, Inc., a national leader in Health Care Products and Services, has an immediate opening in their Marion, N.C. plant due to expansion of the Information Services Department.

The successful candidate will be responsible for system performance, installation of software releases, installation of new devices, and analysis and resolution of system problems.

The following skills are required:

- **Minimum 3-5 years total D.P. experience**
- **2 years system programming experience on the HP 1000 using Fortran 77**
- **Knowledge of RTE-A, DS 1000, and Data Communication**

Experience listed below would be considered a plus:

- **Manufacturing environment**
- **C.I.S. Lab. Manager**
- **IBM 8100 and/or IBM S/38 programming**

We offer a challenging career with excellent benefits and working conditions. Please send detailed resume - including salary requirements - In strict confidence to:

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Marion, NC 28752

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COMPUTER SYSTEMS PROGRAMMER

Maintenance, support and on-site installation assistance of initial software release for transmission control protocol element. Incorporation of customer specified enhancements for future software releases.

Requires B.S. Degree in Computer Science. Requires two years experience with communications software and knowledge of Telcon software and DDN protocols. Salary $2,576.00 per month.

Submit resumes to:

Mr. Dick Hewetson
#5-81
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309 Second Avenue South
Minneapolis, MN 55401

DATA ADMINISTRATOR

Starts at $3,173/month
plus excellent benefits

The City of Seattle needs a Principal Analyst to plan and implement an overall data administration program for an IBM 3083/XA running MVS/TSO and a 4361 with SQL/DS. Data modeling, integrity, security, and strategic planning. REQUIRES: 2 yrs exp in mainframe data or DB admin PLUS 2 addl yrs pr DP exp or BA. Send resume to Denise Hayes, Seattle Personnel Dept, Rm 446 Dexter Horton Bldg, 710 2nd Ave, Seattle, WA 98104 by 9-23-85 or call (206) 625-7982. AA/EOE.

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We have positions available for Programmers, Systems Analysts and DBAs with skills in ADABAS and NATURAL for IBM and VAX environment. Challenging assignments are available throughout the Southeast with large corporate clients. Independent contractors welcome.

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Major high-tech companies in the Southwest have immediate openings for Computer Programmers with degrees in Computer Science or Electrical Engineering.

Current positions require: (a) NOMAD data-base management with MANTIS and/or FOCUS experience a plus; (b) GCOS 8 with experience in customer interface, product support, debugging, etc.

Please send resume to: ARC Technical Services, 2701 E. Thomas Rd., Suite I, Phoenix, AZ 85016.

IMS IDMS ADABAS
DB2 CICS FOCUS
ADR M204 NOMAD

Minimum 1 year experience in any of the above qualifies you for outstanding career advancement nationwide. 500 openings from Programmer to Project Manager, DBA and Systems Programmer. Contact Mitchell Price (413) 586-9961 or send resume in confidence to:

HP ***HANS PRICE ASSOCIATES***
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P/A-CICS, VSAM, COBOL	$25K	Project Mgr-Banking	$42K
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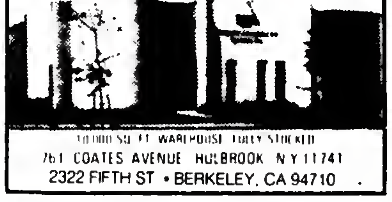

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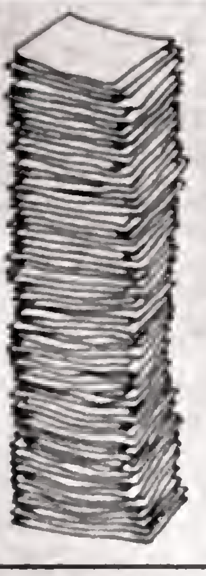

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ADVERTISERS INDEX

ADR ... 3
Advanced Systems, Inc. ... 126
Agile ... 8
Altos Computer Systems ... 106-107
Amdahl Corp. ... 24
AST Research ... 68
AT&T Information Systems ... 42-46,82-83

Bridge Communications ... 20-21
Brookvale Associates ... 130
BRS/Search ... ID/30
Burroughs Corp. ... ID/6

CGA Software ... 18-19
CMI Corp. ... ID/22
Codex Corp. ... 26,ID/19
Compaq Computer Corp. ... 101
Computer Associates ... 60
Computer Technology Group ... ID/11
Comshare, Inc. ... 9
Cosmos ... ID/10
CW Australia ... 78
CW Brazil ... 84
CW Broadcasting ... ID/36
CW Circulation ... 114
CW Extra! ... 92
CW France ... 96
CW Special Report ... 76

D & B Computing Services ... 25,75
Data Design Associates ... ID/7
Data Processing Management Assoc. ... 116
Datagram ... 40,113
Dataproducts ... 31
Datasphere, Inc. ... 130
Davox Communications Corp. ... 97
DEST ... 62
Develcon ... ID/32-ID/33
Digital Communications Assocs. ... 72-73,110-111

Eastman Kodak Co. ... 50-51
Electrohome Limited ... 80-81
EMC Corp. ... 53
Emerald Systems Corp. ... 6
Excelan ... 4

Fischer Innis ... 61
Fusion Products ... ID/6
Future Software ... ID/17

Goal Systems ... 94
Gould ... 100
Graham Magnetics ... 118
Grid Systems Corp. ... 24
Group Operations, Inc. ... 8

H & W Computer Systems ... ID/26
Hewlett Packard ... 32-33
Highlander Systems, Inc. ... 30
Honeywell Information Systems ... 65-67
HOTSITE ... 47
Hughes Aircraft ... ID/24

IBM ... 36-37,ID/8-ID/9,105
IDE Associates ... ID/27
Infinet ... ID/23
Infodata Systems ... 63
Informatics ... ID/29
Information Builders, Inc. ... 39
Information Science Inc. ... 120
Infotron Systems Corp. ... 54-55
Innovation Data Processing ... 7
ITT Courier ... 88-89
ITT Information Systems ... 117

Local Data ... ID/36
Logicware ... ID/18

3M Company ... 56
Macmillan Book Clubs, Inc. ... 13
Martin Marietta ... 30,ID/1-ID/4,124
Michaels, Ross & Cole ... ID/24
MicroPro ... 91,93
MSA ... ID/12-ID/13
Multimate International Corp. ... 48-49

NCR-ADDS ... 108
NCR Comten ... 41
NCR Corp. ... 28-29
NEC Corp. ... 74
North Ridge Software, Inc. ... ID/35

OMNI Resources, Inc. ... 14
Oracle Corp. ... 77

Pansophic Systems ... 112
Paradyne ... ID/14
PCI ... 15
Phoenix Computer Products ... 64
PLC Systems, Inc. ... 70
Protocol Computers, Inc. ... ID/28

Quality Micro Systems ... 38

Raychem Corp. ... 12
Realia Inc. ... 122
Rolm Corp. ... 58-59

SAS Institute ... ID/16,ID/20-ID/21
Schonfeld & Associates, Inc. ... 130
SICOB '85 ... 26
Softool Corp. ... 84
SofTouch Systems, Inc. ... 38
Software Concepts ... 57
Software Technologies & Research(STAR,Inc.) ... 70
Sperry Corp. ... 23,85,109
SPI ... 131
Sun Microsystems, Inc. ... 121,123,125,127
SVP ... 12
Syncsort ... 5
Sysed ... 130
System Software Associates ... 104

Tallgrass Technologies ... 22
Tandem Computers ... 34-35
Telex Computer Products ... ID/31
Texas Instruments ... ID/34
Thorn EMI ... 79
Toshiba America Inc. ... 90
TRW ... 128-129
Tymnet ... 27

UCCEL Corp. ... 71
The Ultimate Corp. ... 10-11
Ungermann-Bass ... 102-103
Unilease Computer Corp. ... 69
Universal Data Systems ... 86

Ven-Tel Inc. ... 152
Viking Software Services ... 6

Westin Hotels ... 96

Xanthus Corp. ... 78

Yourdon ... 119

Zenith Data Systems ... 99
Zentec Corp. ... 52

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Computerworld can be purchased on 35 mm microfilm through University Microfilm Inc., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. Computerworld is indexed; write to Circulation Dept. for subscription information.

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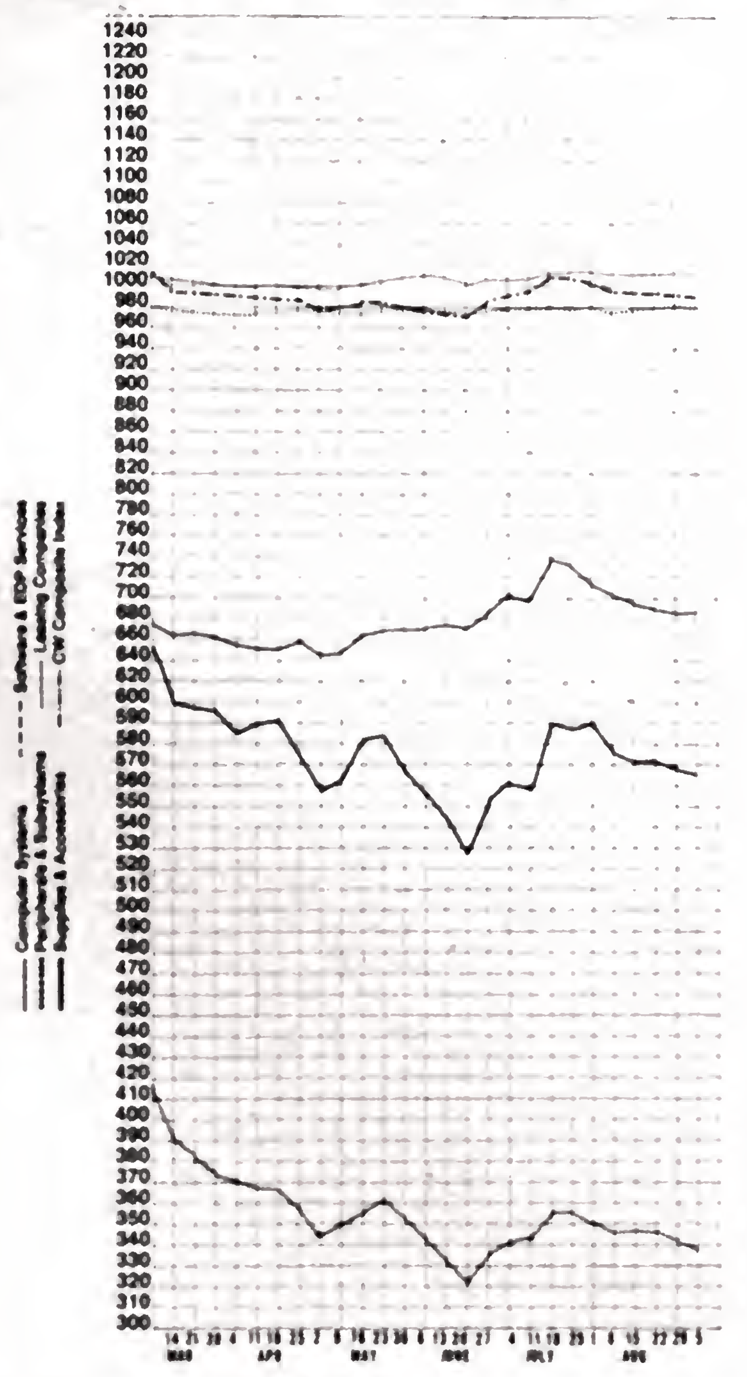

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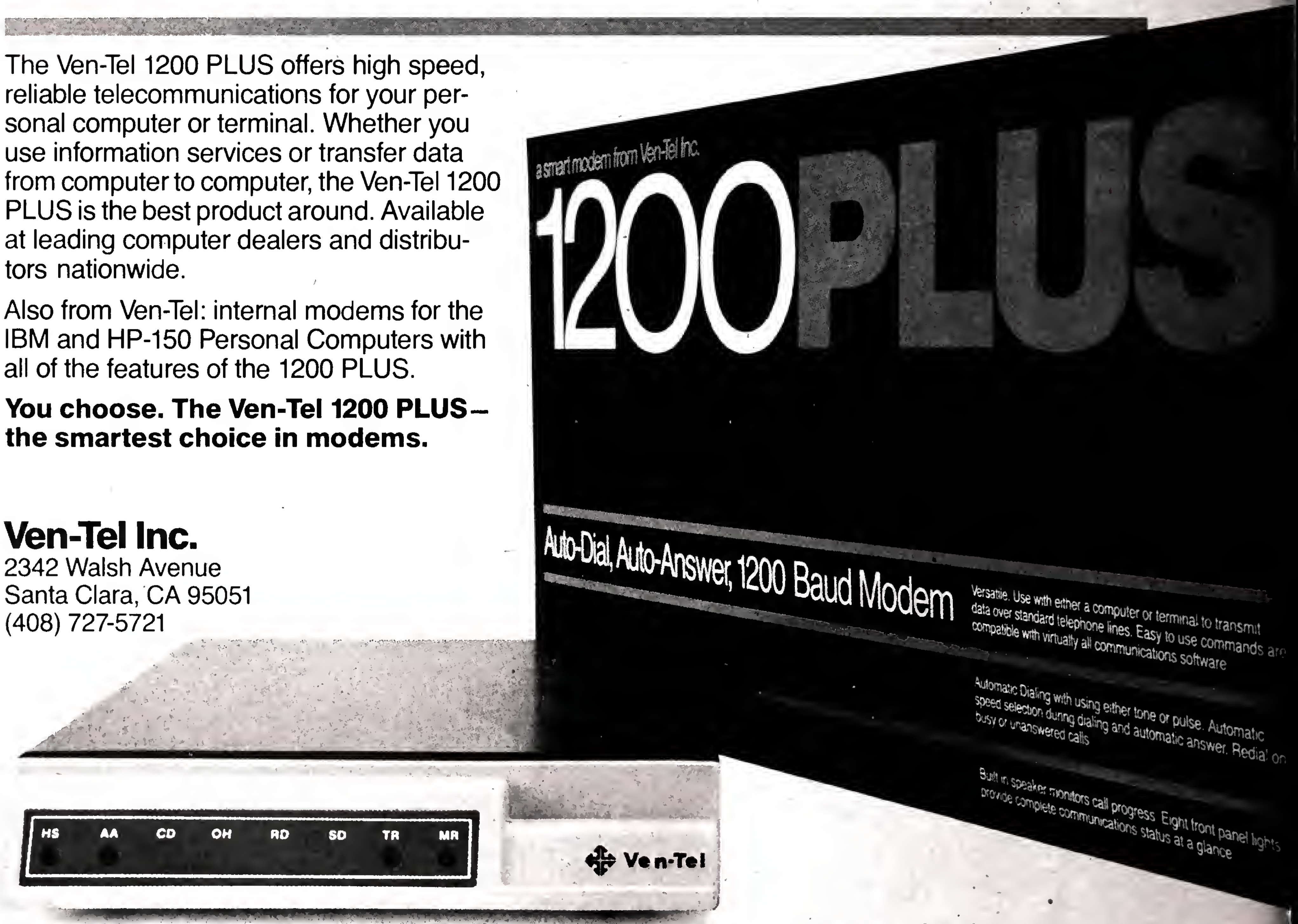
A few smart reasons to buy our smart modem:

Features	**Ven-Tel 1200 PLUS**	**Hayes**
1200 and 300 baud, auto-dial, auto-answer	Yes	Yes
Compatible with "AT" command set	Yes	Yes
Can be used with CROSSTALK-XVI or Smartcom II software	Yes	Yes
Regulated DC power pack for cool, reliable operation	Yes	**No**
Eight indicator lights to display modem status	Yes	Yes
Speaker to monitor call progress	Yes	Yes
Attractive, compact aluminum case	Yes	Yes
Two built-in phone connectors	Yes	**No**
Compatible with The Source and Dow Jones News Retrieval	Yes	Yes
Unattended remote test capability	Yes	**No**
Phone cable included	Yes	Yes
Availability	Now	
Price	**$499**	**$599**

The Ven-Tel 1200 PLUS offers high speed, reliable telecommunications for your personal computer or terminal. Whether you use information services or transfer data from computer to computer, the Ven-Tel 1200 PLUS is the best product around. Available at leading computer dealers and distributors nationwide.

Also from Ven-Tel: internal modems for the IBM and HP-150 Personal Computers with all of the features of the 1200 PLUS.

You choose. The Ven-Tel 1200 PLUS— the smartest choice in modems.


a smart modem from Ven-Tel Inc.
1200PLUS
Auto-Dial, Auto-Answer, 1200 Baud Modem
Versatile. Use with either a computer or terminal to transmit data over standard telephone lines. Easy to use commands are compatible with virtually all communications software
Automatic Dialing with using either tone or pulse. Automatic speed selection during dialing and automatic answer. Redial on busy or unanswered calls
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CD
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RD
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